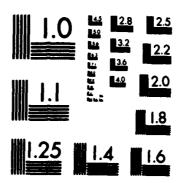
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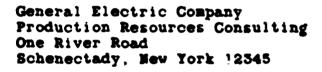
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AFVAL-TR-86-4006 Volume V Part 6

# AD-A181 705

INTEGRATED INFORMATION
SUPPORT SYSTEM (IISS)
Volume V - Common Data Model Subsystem
Part 6 - NDDL Processor Product Specification
Section 5.10.9 through 4.2







Final Report for Period 22 September 1980 - 31 July 1985 Movember 1985

Approved for public release; distribution is unlimited.

MATERIALS LABORATORY AIR PORCE WRIGHT AERONAUTICAL LABORATORIES AIR PORCE SYSTEMS COMMAND WRIGHT-PATTERSON AFB. ON 45433-6533

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#### 11. Title

Integrated Information Support System (IISS)
Vol V - Common Data Model Subsystem
Part 6 - NDDL Processor Product Specification
Section 3.10.9 through 4.2

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#### **PREFACE**

This product specification covers the work performed under Air Force Contract F33615-80-C-5155 (ICAM Project 6201). This contract is sponsored by the Materials Laboratory, Air Force Systems Command, Wright-Patterson Air Force Base, Ohio. It was administered under the technical direction of Mr. Gerald C. Shumaker, ICAM Program Manager, Manufacturing Technology Division, through Project Manager, Mr. David Judson. The Prime Contractor was Production Resources Consulting of the General Electric Company, Schenectady, New York, under the direction of Mr. Alan Rubenstein. The General Electric Project Manager was Mr. Myron Hurlbut of Industrial Automation Systems Department, Albany, New York.

Certain work aimed at improving Test Bed Technology has been performed by other contracts with Project 6201 performing integrating functions. This work consisted of enhancements to Test Bed software and establishment and operation of Test Bed hardware and communications for developers and other users.

Documentation relating to the Test Bed from all of these contractors and projects have been integrated under Project 6201 for publication and treatment as an integrated set of documents. The particular contributors to each document are noted on the Report Documentation Page (DD1473). A listing and description of the entire project documentation system and how they are related is contained in document FTR620100001, Project Overview.

The subcontractors and their contributing activities were as follows:

#### TASK 4.2

Bubcontractors	<u> </u>
Boeing Military Aircraft Company (BMAC)	Reviewer
D. Appleton Company (DACOH)	Responsible for IDEF support, state-of-the-art literature search
General Dynamics/ Ft. Worth	Responsible for factory view function and information

models

Subcontractors

Role

Illinois Institute of Technology

Responsible for factory view function research (IITRI) and information models of small and medium-size business

Morth American Rockwell

Reviewer

Morthrop Corporation

Responsible for factory view function and information

models

Pritsker and Associates

Responsible for IDEF2 support

SofTech

Responsible for IDEFO support

#### TASKS 4.3 - 4.9 (TEST BED)

Subcontractors

Role

Boeing Military Aircraft Company (BMAC)

Responsible for consultation on applications of the technology and on IBM computer technology.

Computer Technology Associates (CTA)

Assisted in the areas of communications systems, system design and integration methodology, and design of the Network Transaction Manager.

Control Data Corporation (CDC)

Responsible for the Common Data Model (CDM) implementation and part of the CDM design (shared with DACON).

D. Appleton Company (MOOM)

Responsible for the overall CDM Subystem design integration and test plan, as well as part of the design of the CDM (shared with CDC). DACON also developed the Integration Nethodology and did the schema mappings for the Application Subsystems.

Subcontractors	Role
Digital Equipment Corporation (DEC)	Consulting and support of the performance testing and on DEC software and computer systems operation.
McDonnell Douglas Automation Company (McAuto)	Responsible for the support and enhancements to the Network Transaction Manager Subsystem during 1984/1985 period.
On-Line Software International (OSI)	Responsible for programming the Communications Subsystem on the IBM and for consulting on the IBM.
Rath and Strong Systems Products (RSSP) (In 1985 became McCormack & Dodge)	Responsible for assistance in the implementation and use of the MRP II package (PIOS) that they supplied.
SofTech, Inc.	Responsible for the design and implementation of the Network Transaction Manager (MTM) in 1981/1984 period.
Software Performance Engineering (SPE)	Responsible for directing the work on performance evaluation and analysis.
Structural Dynamics Research Corporation (SDRC)	Responsible for the User Interface and Virtual Terminal Interface Subsystems.

Other prime contractors under other projects who have contributed to Test Bed Technology, their contributing activities and responsible projects are as follows:

Contractors	ICAN Project	Contributing Activities
Boeing Military Aircraft Company (BHAC)	1701, 2201, 2202	Enhancements for IBM node use. Technology Transfer to Integrated Sheet Metal Center (ISMC)

Contractors	ICAM Project	Contributing Activities
Control Data Corporation (CDC)	1502, 1701	IISS enhancements to Common Data Model Processor (CDMP)
D. Appleton Company (DACON)	1502	IISS enhancements to Integration Methodology
General Electric	1502	Operation of the Test Bed and communications equipment.
Nughes Aircraft Company (NAC)	1701	Test Bed enhancements
Structural Dynamics Research Corporation (SDRC)	1502, 1701, 1705	IISS enhancements to User Interface/Virtual Terminal Interface (UI/VTI)
Systran	1502	Test Bed enhancements. Operation of Test Bed.

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#### **FOREWORD**

This is the fourth bound segment of four comprising Volume V, Part 6 of the Final Technical Report. It contains Section 3.10.9 through 4.2.

### 5.10.9 Include File Descriptions

The following list contains a purpose and description of each include file listed in 3.10.4 as specified in the source code. The language it is written in is also given.

#### NDDL COMMAND PROCESSOR Include File Description

FILE NAME: CHKHODL

PURPOSE: DETERMINE IF CURRENT MODEL EXISTS FOR A SESSION

LANGUAGE: VAX-11 COBOL

#### DESCRIPTION:

DETERMINE IF THE GLOBAL VARIABLE MODEL-NO HAS A CURRENT MODEL NUMBER. THIS WILL BE SET BY THE CREATE MODEL OR THE ALTER MODEL COMMAND PROCESSOR. IF MODEL-NO CONTAINS A ZERO, THEN A CURRENT MODEL HAS NOT BEEN ESTABLISHED

#### NDDL COMMAND PROCESSOR Include File Description

FILE NAME: CMDS

PURPOSE: COMMAND NO. FOR EACH MDDL/MDML COMMAND

LANGUAGE: C

#### DESCRIPTION:

DESCRIPTION

CONTAINS THE UNIQUE COMMAND MUBER FOR EACH WDDL AND NDML COMMAND. THIS NUMBER IS USED IN PROCESSING TO

DETERMINE THE APPROPRIATE PROCESSOR TO EXECUTE.

PE 630141100 l Bovenber 1965

# MCCL COMMAND PROCESSOR Include File Description

FILE HAME: COPY

PURPOSE: PROCESS ERROR INCLUDE FILE LANGUAGE: VAX-11 COSOL

DESCRIPTION: -----

Market and the Control of the Contro

### MDDL COMMAND PROCESSOR Include File Description

FILE MANE. SCLIST

PURPOSE: CONTAINS A LIST OF ENTITY CLASS NUMBERS LANGUAGE: VAX-11 COSOL

DESCRIPTION: --------

> THIS LIST IS USED WHEN PROCESSING MODL HODELING COMMANDS

### NDDL COMMAND PROCESSOR Include File Description

FILE MANE: ERRPRO

PURPOSE: PROCESS ERROR INCLUDE FILE LANGUAGE: VAX-11 COROL

DESCRIPTION:

# MDDL COMMAND PROCESSOR Include File Description

FILE MANE: PPOODE

PURPOSE: FORM PROCESSOR RETURN CODES

LANGUAGE: C

DESCRIPTION:

### NDDL COMMAND PROCESSOR Include File Description

FILE MANE: PPPARM

PURPOSE: FORM PROCESSOR PARAMETERS

LANGUAGE: C

DESCRIPTION:

DESCRIPTION: THESE DATA DEFINITIONS ARE USED

IN THE FORM PROCESSOR ROUTINES.

### NDDL COMMAND PROCESSOR Include File Description

FILE WAME: KCLIST

PURPOSE: PROCESS ERROR INCLUDE FILE

LANGUAGE: VAX-11 COBOL

DESCRIPTION:

### NDDL COMMAND PROCESSOR Include File Description

FILE MAME: KEYLIST

PURPOSE: DATA STRUCTURE FOR NDDL HODELLING COMMANDS

LANGUAGE: C

DESCRIPTION:

DESCRIPTION

DATA STRUCTURE THAT HOLDS ENTITES ITS KEY CLASSES AND KEY CLASS HEMBERS. THIS STRUCTURE IS USED FOR THE NODEL MODELLING COMMANDS.

# MDDL COMMAND PROCESSOR Include File Description

FILE NAME: KWDTBL

PURPOSE: KEYWORD TABLE LANGUAGE: VAX-11 COBOL

#### DESCRIPTION:

LIST OF KEYWORDS, OBJECT NUMBER, KEYWORD NUMBER BELONGING IN THE MODEL

### MDDL COMMAND PROCESSOR Include File Description

FILE MAME: LISTID

PURPOSE: PROVIDES LIST OF PARSED OBJECTS LANGUAGE: C

DESCRIPTION: DESCRIPTION

### MDDL COMMAND PROCESSOR Include File Description

FILE NAME: LISTNOS

PURPOSE: VALID LIST NUMBERS

LANGUAGE: VAX-11 COBOL

DESCRIPTION:

LISTMOS INCLUDE FILE WILL CONTAIN THE LIST NUMBERS FOR THE TOKENS OF THE NDDL COMMANDS

### NDDL COMMAND PROCESSOR Include File Description

FILE NAME: LISTREL

PURPOSE: LIST OF RELATIONS LANGUAGE: VAX-11 COBOL

DESCRIPTION:

TABLE HOLDS RELATIONS CLASS NUMBERS AND NAMES

### NDDL COMMAND PROCESSOR Include File Description

FILE NAME: LISTS

PURPOSE: PROVIDES THE DIMENSIONS OF THE NDDL LISTS LANGUAGE: C

DESCRIPTION:

DESCRIPTION

### MDDL COMMAND PROCESSOR Include File Description

FILE NAME: MDDL

PURPOSE: \*\*\*\* PURPOSE NOT FOUND BY STRIPPER \*\*\*\*

LANGUAGE: C

DESCRIPTION:

### NDDL COMMAND PROCESSOR Include File Description

FILE NAME: MDDLEXY

PURPOSE: \*\*\*\* PURPOSE NOT POUND BY STRIPPER \*\*\*\*

LANGUAGE: C

DESCRIPTION:

#### NDDL COMMAND PROCESSOR Include File Description

FILE NAME: OK

PURPOSE: GOOD RETURN CODE VALUE FOR UI LANGUAGE: C

DESCRIPTION:

DESCRIPTION

CONTAINS THE VALUE FOR A GOOD RETURN CODE

FROM THE USER INTERPACE

### MDDL COMMAND PROCESSOR Include File Description

FILE HAME: ORCLEDA

PURPOSE: WE DEFINITION FOR THE ORACLE LOGIN AREA LANGUAGE: VAX-11 COSOL

DESCRIPTION:

THE ORACLE LOGOW DATA AREA

# MDDL COMMAND PROCESSOR Include File Description

FILE NAME: RCDEPEC

PURPOSE: LIST OF KEYS NIGRATED VIA A RELATION

LANGUAGE: VAX-11 COBOL

#### DESCRIPTION:

The RC-DEPEC-LIST is used by the MDDL modeling commands to identify which key

#### NDDL COMMAND PROCESSOR Include File Description

FILE NAME: RELTEL

PURPOSE: LIST OF RELATION CLASSES IN A MODEL LANGUAGE: VAX-11 COSOL

DESCRIPTION:

HOLD RELATION CLASS NUMBERS BELONGING TO A MODEL

### MDDL COMMAND PROCESSOR Include File Description

FILE WAME: REWLIST

PURPOSE: LIST OF ATTRIBUTES AND INHERITED TAG PAIRS

LANGUAGE: VAX-11 COBOL

DESCRIPTION:

### MDDL COMMAND PROCESSOR Include File Description

FILE NAME: SDLIST

PURPOSE: SEC-DECOMPOSITION-LIST

LANGUAGE: VAX-11 COBOL

DESCRIPTION:

THIS LIST REPRESENTS ALL ENTITY CLASSES AND RELATIONS

MAKING UP EITHER THE SURROGATE ENTITY CLASS OR THE COMBINATION OF SEC'S RESULTING FROM JOINS

IN THE NDML SELECT STATEMENT.

THIS TABLE IS USED AS INPUT TO ROUTINE CDP4A WHICH CAN VERIFY THE LEGALITY OF A SEC STRUCTURE

#### MDDL COMMAND PROCESSOR Include File Description

FILE NAME: SRVRET

PURPOSE: AS THE RETURN GIVEN A TABLE-FULL ERROR

LANGUAGE: VAX-11 COBOL

#### DESCRIPTION:

MODIFIED 11/2/83 TO INCLUDE RET-CODE-5

MODIFIED 1/9/84 TO INCREASE ALL ERROR CODES TO PIC X(5)

AND TO ELIMINATE ALPHA'S

MODIFIED 1/26/84 TO ADD RET-CODE FOR GETUSR-MOT-SUCC

SRV-SUCCESSFUL ADDED FOR GENERIC RETURN

MODIFIED 2/7/84 TO ADD ERROR CODES FOR ENTRY-MOT-FOUND

MODIFIED 2/8/84 TO ADD WHTHST-MOT-SUCCESSFUL

MODIFIED 2/20/84 TO ADD TSTMOD MEW CODES.

MODIFIED 20 AUG 84 INITALIZE ALL LOCAL VARAIBLES TO SPACES OR 0.

MODIFIED 5/21/85 TO ADD RCL AND FILGEN RETURN CODES

#### NDDL COMMAND PROCESSOR Include File Description

FILE MANE: STDTYP

PURPOSE: STANDARD TYPE DEFINITIONS

LANGUAGE: C

#### DESCRIPTION:

#### DESCRIPTION

THIS FILE ENSURES THAT THE FOLLOWING STANDARD TYPES ARE AVAILABLE:

FLOAT - SINGLE PRECISION FLOAT DOUBLE - DOUBLE PRECISION FLOAT

LONG - 32 BIT (OR LARGER) SIGNED INTEGER

LBITS - 32 BITS (OR MORE) FOR BIT MANIPULATION

INT - NATURAL SIZE SIGNED INTEGER UNSIGNED - NATURAL SIZE UNSIGNED INTEGER

BOOL - MATURAL SIZE LOGICAL (ZERO / MON-ZERO ONLY)

SHORT - 16 BIT (OR LARGER) SIGNED INTEGER
USHORT - 16 BIT (OR LARGER) UNSIGNED INTEGER
BITS - 16 BITS (OR MORE) FOR BIT MANIPULATION

CHAR - SINGLE MACHINE CHARACTER (REAL CHARACTERS ALWAYS POSITIVE)

TINY - 8 BIT (OR LARGER) SIGNED INTEGER
UTINY - 8 BIT (OR LARGER) UNSIGNED INTEGER

TBITS - 8 BITS (OR MORE) FOR BIT MANIPULATION

TBOOL - 8 BIT (OR LARGER) LOGICAL (ZERO / NON-ZERO ONLY)

METACHAR - 16 BIT (OR LARGER) AUGMENTED CHARACTER (SIGNED)

VOID - FUNCTION THAT RETURNS NO VALUE

FORTRAN - STORAGE CLASS FOR FOREIGN (NON-C) ROUTINES
OR C ROUTINES

WHICH ARE CALLABLE FROM FOREIGN ROUTINES

SINCE NOT ALL COMPILERS SUPPORT USHORT, TINY, AND UTINY, THE FUNCTIONS

# USHORT(), TIMY(), AND UTIMY() SHOULD BE USED WHENEVER REFERENCING THEM.

IN ADDITION, THE FOLLOWING UTILITY MACROS ARE DEFINED: LURSHIFT(N, B) - UNSIGNED LONG RIGHT SHIFT

MAX(A, B) - MAXIMUM OF A AND B HIM(A, B) - MINIMUM OF A AND B

<mark>እንደተያ</mark>ለፈት እና የተያለፈ እና እንደሚያለት እና የሚያለፈ የተያለፈ የተ

## MDDL COMMAND PROCESSOR Include File Description

ABS(A) - ABSOLUTE VALUE OF A

STRASM(A, B) - TRAMSPORTABLE A = B FOR STRUCTURES

WULL - WULL POINTER VALUE (0)

TRUE - 1 FALSE - 0

SUCCESS - EXIT(SUCCESS) INDICATES SUCCESSFUL

COMPLETION

FAILURE - EXIT(FAILURE) INDICATES ERRORS

## THE FOLLOWING SYMBOLS SHOULD BE DEFINED BASED ON THE COMPILER BEING USED:

USHORT - COMPILER SUPPORTS UNSIGNED SHORT TIMY - COMPILER TREATS CHAR AS SIGNED

UTIMY - CHAR IS SIGNED AND COMPILER SUPPORTS

UNSIGNED CHAR

VOID - COMPILER SUPPORTS VOID FORTRAM - COMPILER SUPPORTS FORTRAM STRASM - DEFINE APPROPRIATE MACRO

SUCCESS - DEFINE APPROPRIATE VALUE IF NOT 0 FAILURE - DEFINE APPROPRIATE VALUE IF NOT 1

#### MDDL COMMAND PROCESSOR Include File Description

FILE NAME: UNIQENO

PURPOSE: UNIQUE NUMBER ASSIGNMENTS FOR CDM OBJECTS

LANGUAGE: C

DESCRIPTION:

DESCRIPTION

## NDDL COMMAND PROCESSOR Include File Description

FILE MAME: VVDI

PURPOSE: LIST OF DATA ITEMS IN A VIEW LANGUAGE: VAX-11 COBOL

DESCRIPTION:

USED BY CREATE VIEW ...

#### MDDL COMMAND PROCESSOR Include File Description

FILE NAME: VWFROM

PURPOSE: LIST OF ENTITIES SPECIFIED IN A VIEW LANGUAGE: VAX-11 COBOL

DESCRIPTION:

IN THE 'FROM' CLAUSE

## NDDL COMMAND PROCESSOR Include File Description

FILE NAME: VWRC

PURPOSE: LIST OF RELATION CLASSES INHERENT TO A VIEW LANGUAGE: VAX-11 COBOL

DESCRIPTION:

USED IN THE 'WHERE' CLAUSE

#### NDDL COMMAND PROCESSOR Include File Description

FILE HAME: VVRETR

PURPOSE: LIST OF ENTITIES AND TAGE SPECIFIED IN A VIEW LANGUAGE: VAX-11 COBOL

DESCRIPTION:

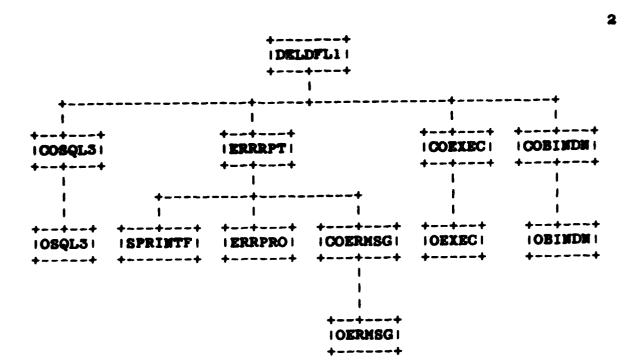
IN THE SELECT CLAUSE

## 8.10.10 Hierarchy Chart

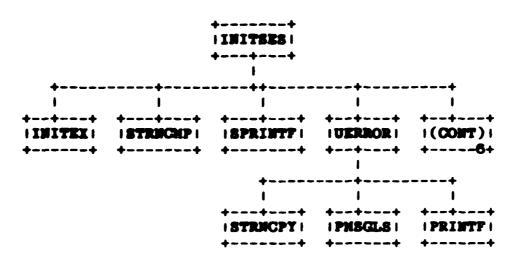
The following hierarchy charts show the relationships between all of the modules mentioned in the above documentation. A module may call a subroutine several times within its code, but the call will only be shown once as a single relationship on this hierarchy chart. All modules shown at the top of the first page are considered Main Programs as described in section 5.10.1 above.

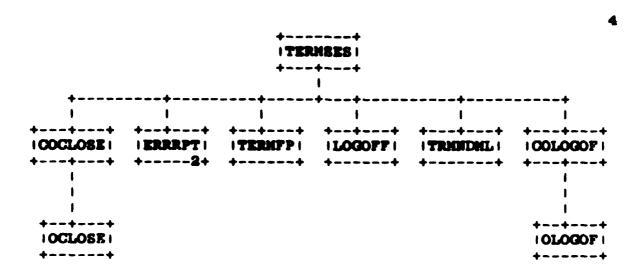
There is an internal paging scheme as marked by the numbers in the upper right corner of each page. An index after the last page of the chart shows where a routine and its calls are first defined. If a routine has no page reference, it either makes no calls or is an external routine. A continuation box on the end of a tree limb shows where that the tree continues on the page numbered mentioned. A number in a box with a routine name points to the page where the routine is further defined within the hierarchy tree. If there is no number in a box, the routine either makes no calls or is an external routine.

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<b>+</b>	*	·	<del>-</del>	·~+	
<b>++</b>		+++	++	+-++	
Initees		PROCEDI	TERMSES	EXIT	
+5+		+++	+4+	<b>++</b>	
<b>+</b>		 	+	+	
ı	ı	ł	1	1	
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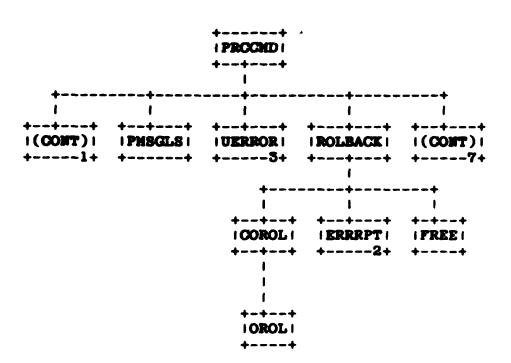


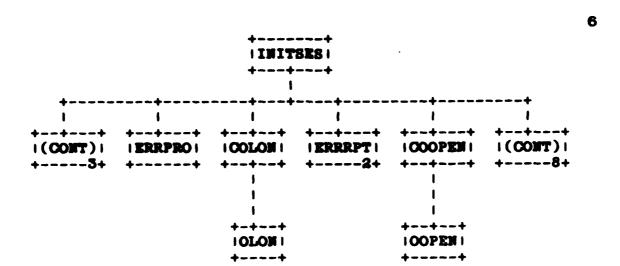
3

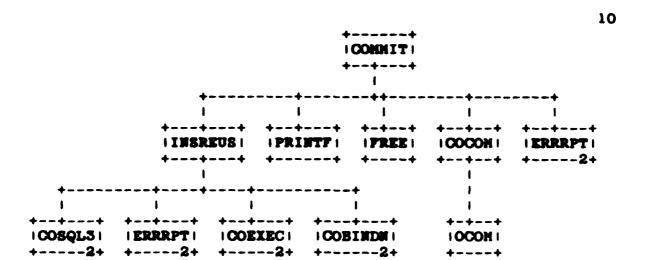




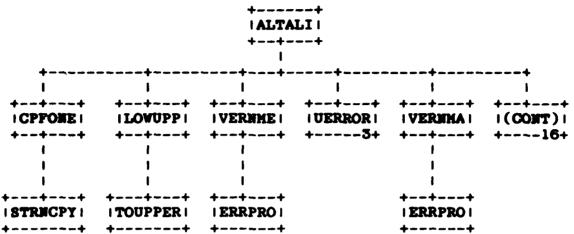
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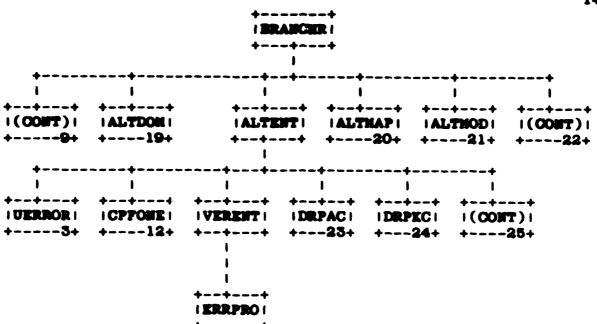


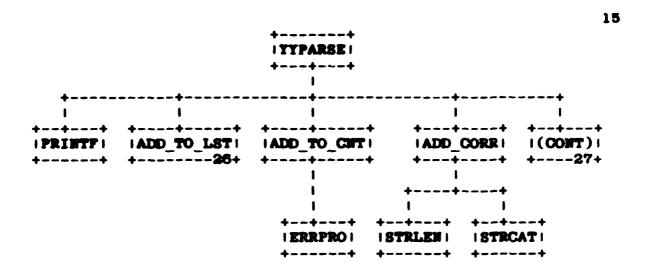
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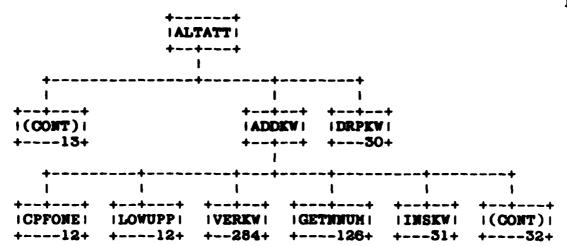


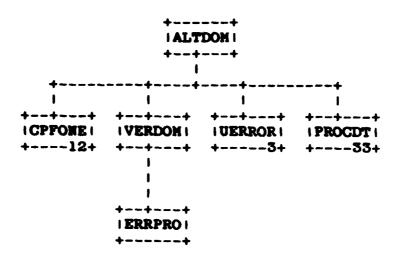


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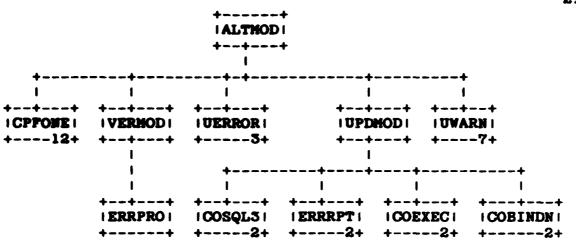
+---12+ +----19+ +-----+ +-----5+ +---29+

3-1133





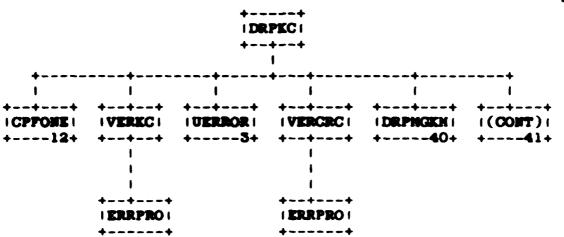
21



3-1138

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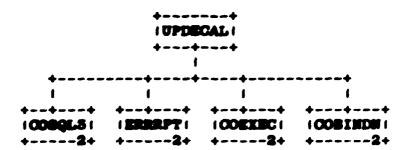




27

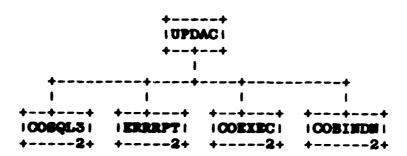
3-1143

28



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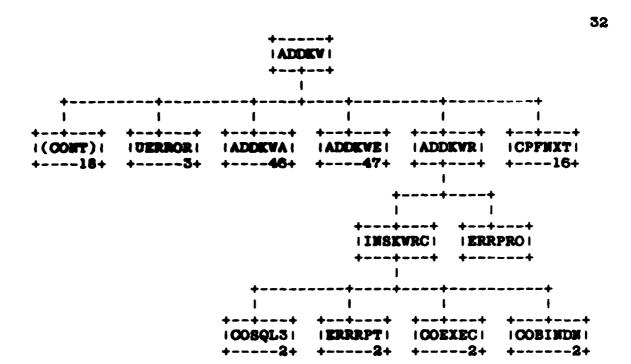


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3-1147



3-1148

+---12+ +---12+ +---16+ +---211+ +----5+ +----48+

3-1150

3-1152

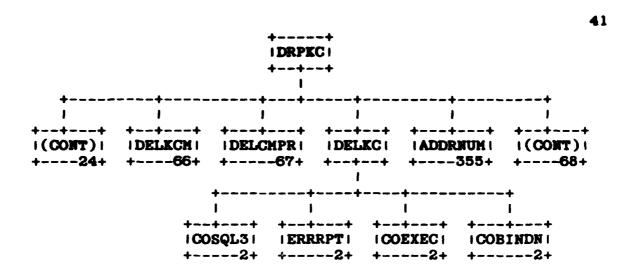
37 <del>+--+---+ +--+---+ +---+ +---+ +--+--+</del> +--+---+ IUERROR! ICPPONE! ICPPRET! IEXCFLAG! IVERMOD! !(CONT)! +----8+ +---12+ +---16+ +---+ +---21+ +----58+

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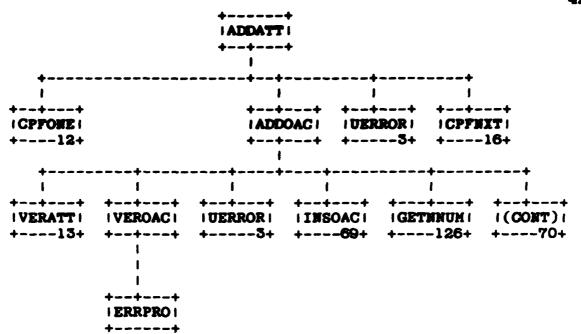
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3-1153

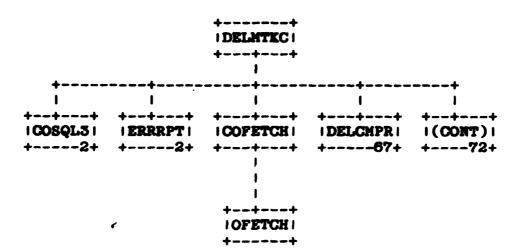
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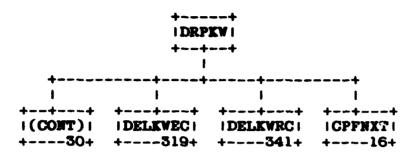
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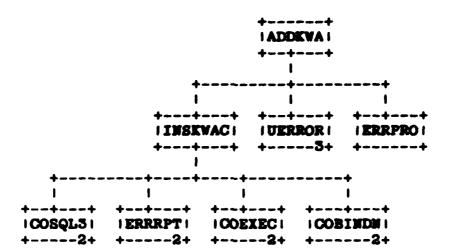
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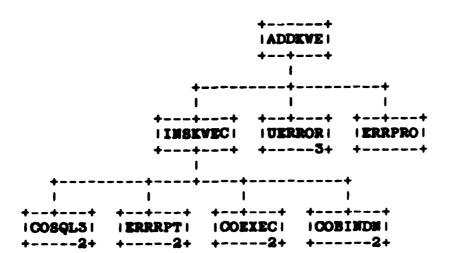
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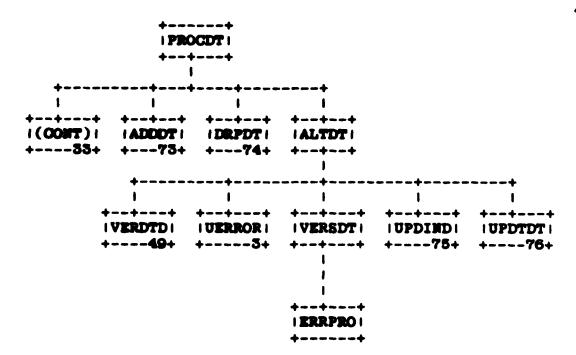


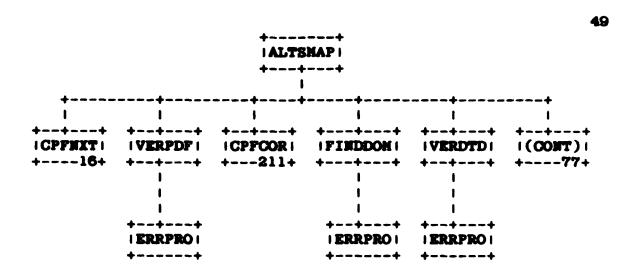
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47

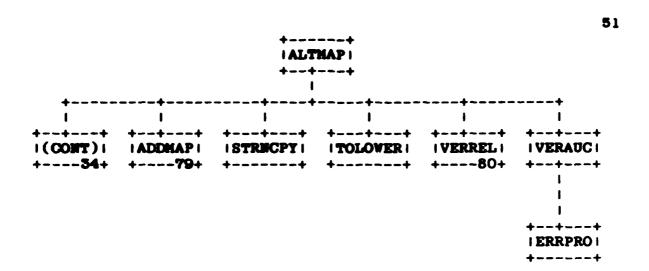




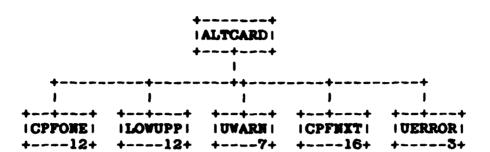


3-1166

<mark>entre de la proposition de la completa de la proposition de la pr</mark>



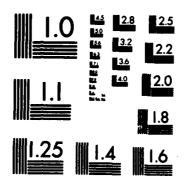
52



| COSQL3| | ERRRPT| | COEXEC| | COBINDN| | +----2+ +----2+ +----2+ +----2+ +----2+ +----2+ +----2+ +----2+ +----2+ +----2+ +----2+ +----2+ +----2+ +----2+

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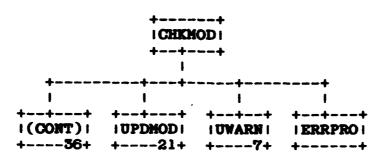
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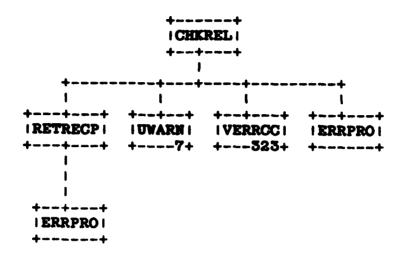
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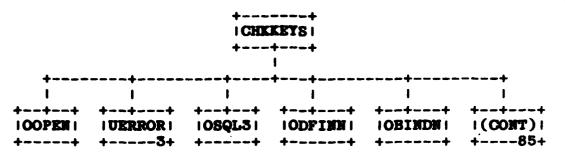


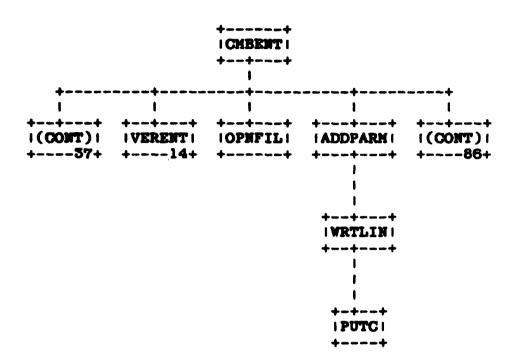
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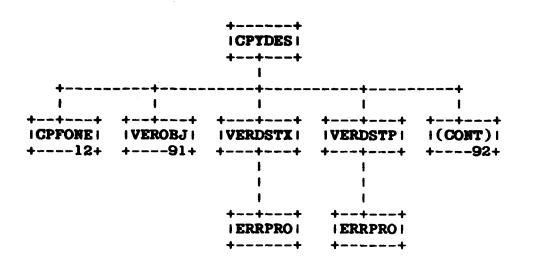
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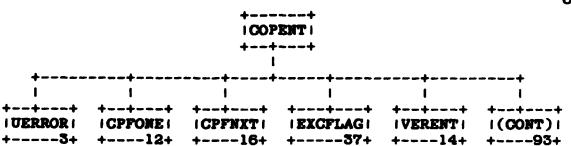




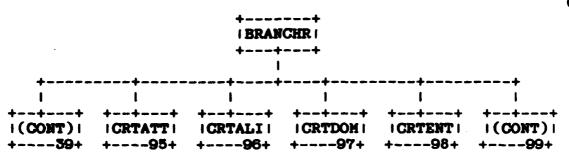
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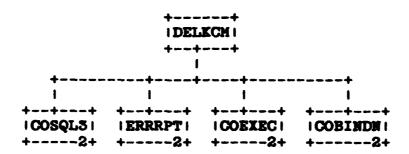
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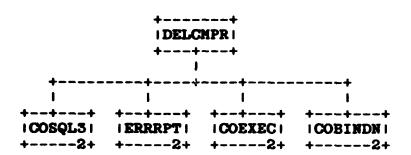
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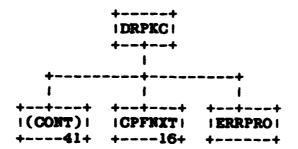
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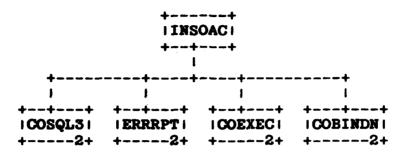


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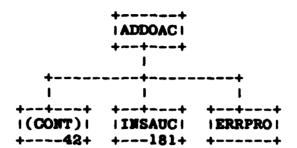


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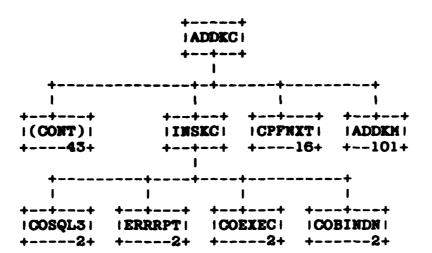


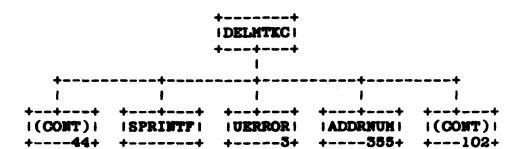


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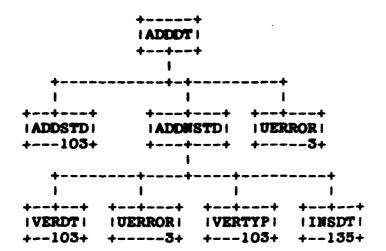


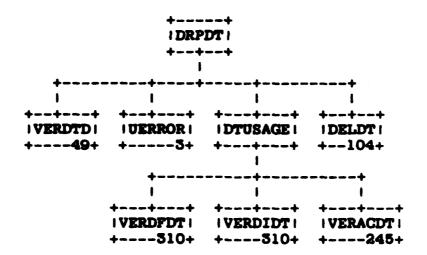
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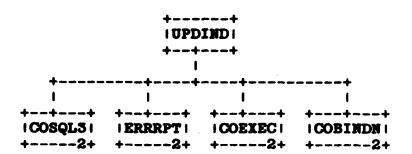




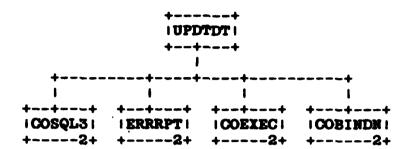
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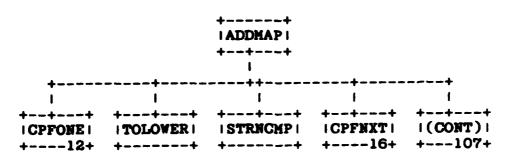


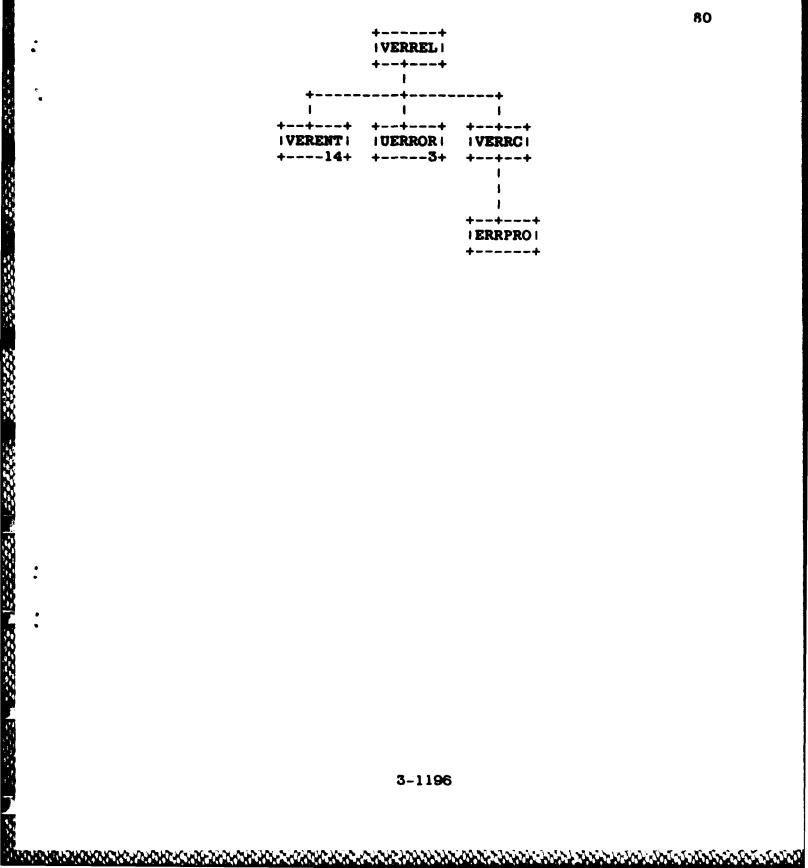
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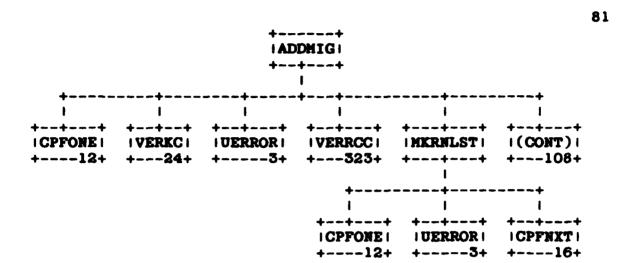


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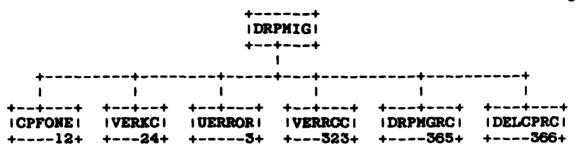


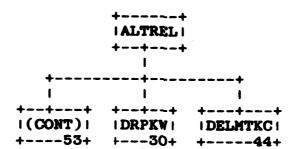


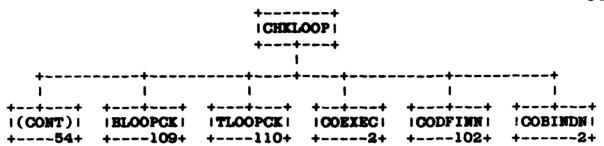


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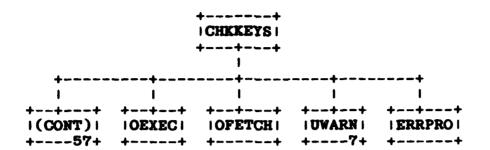
82



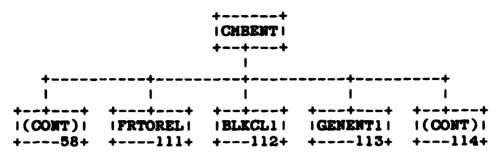


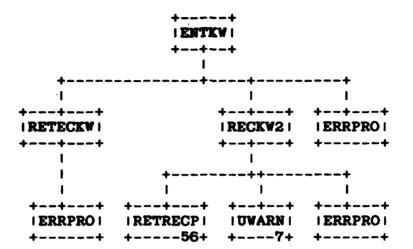


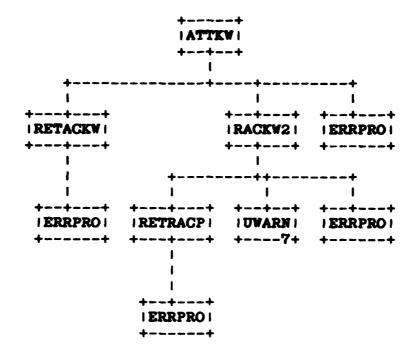
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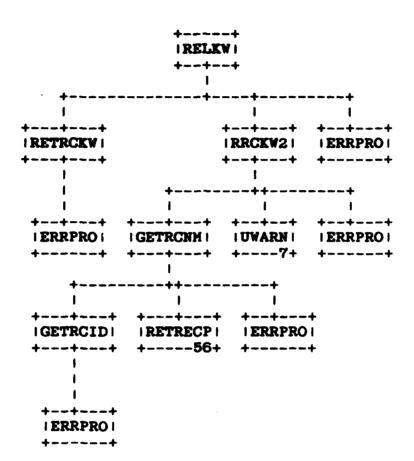


86



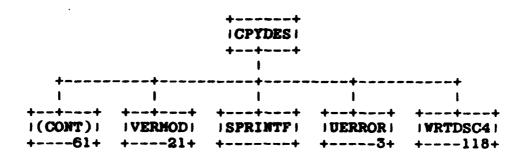


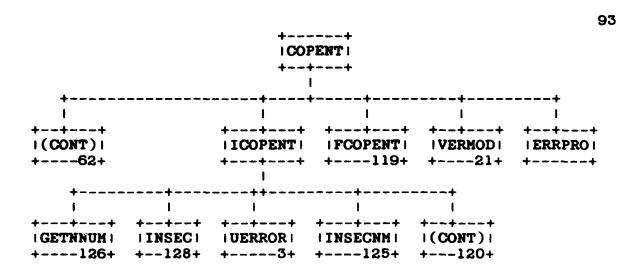




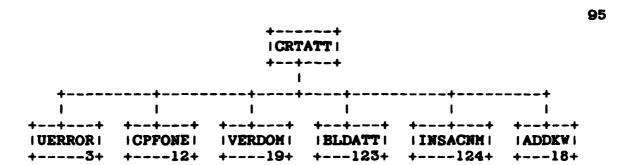
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3-1207

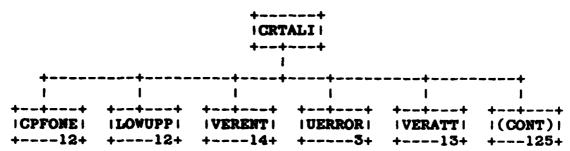




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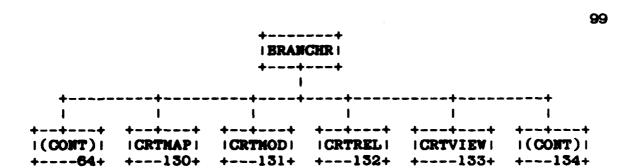


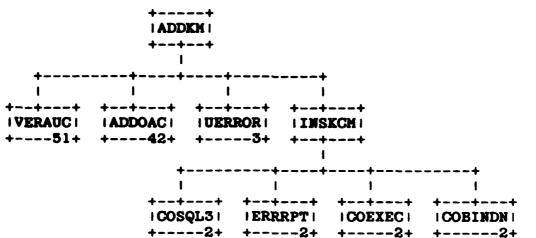
96



98



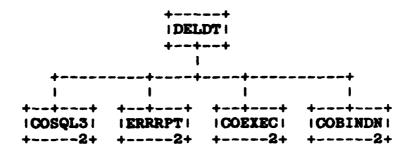




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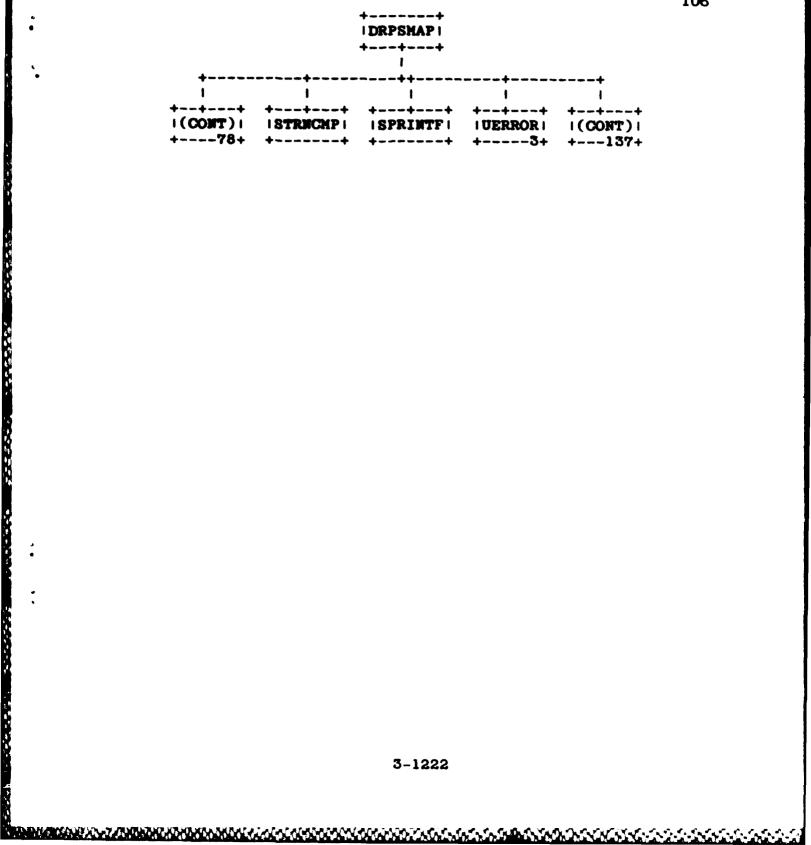
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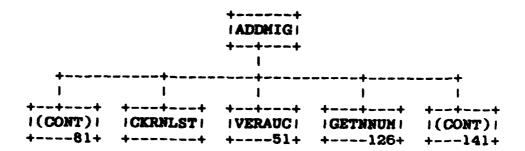
104



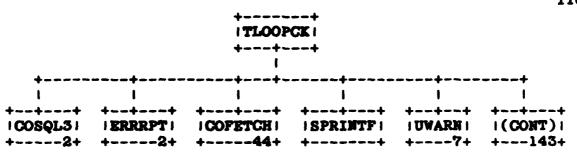
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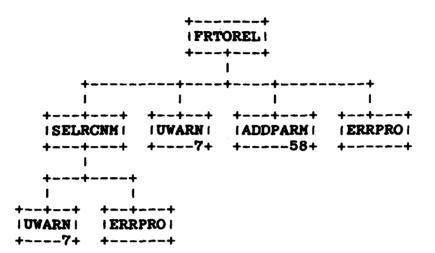


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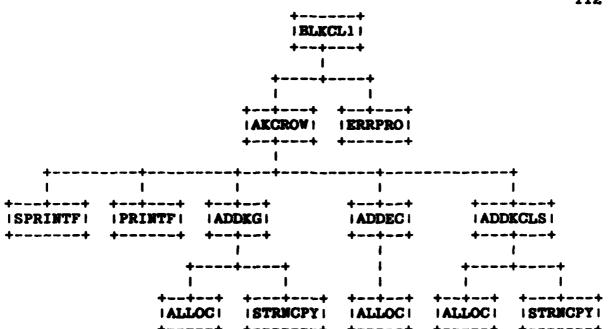


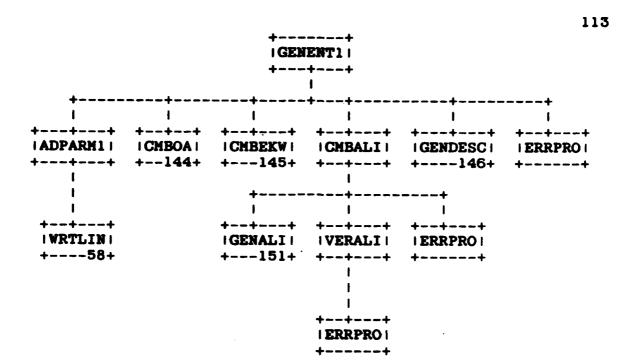
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111

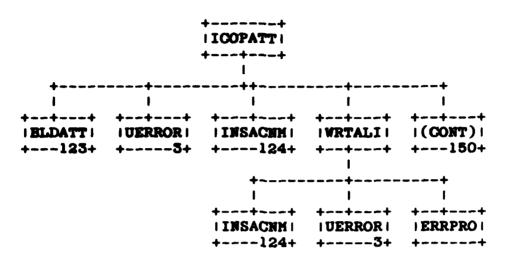


112

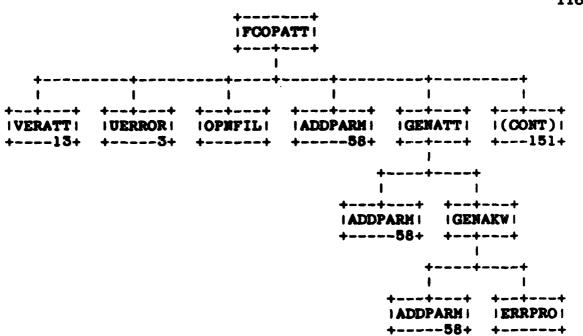




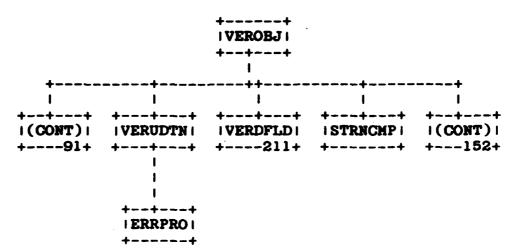
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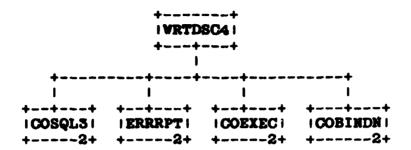
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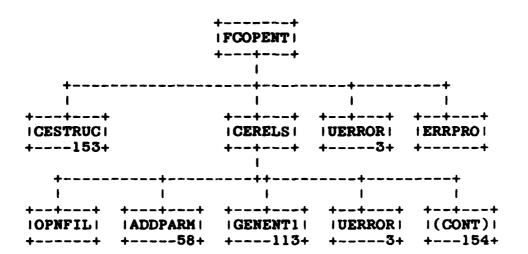


117



118

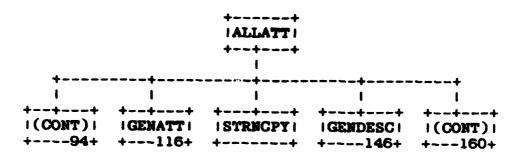




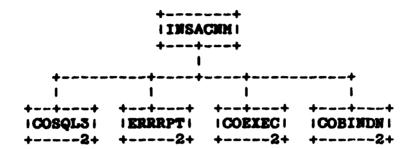
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122

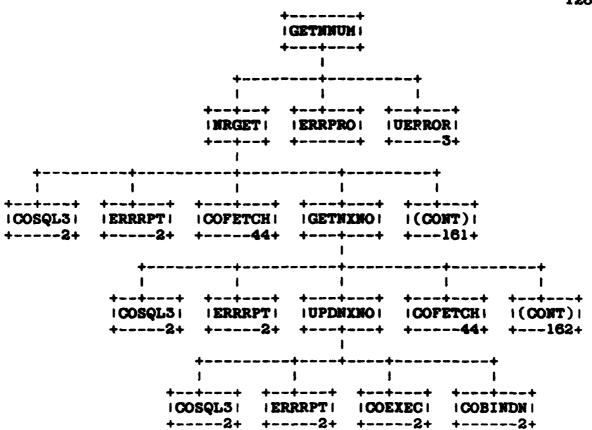


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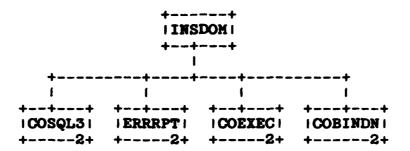
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126

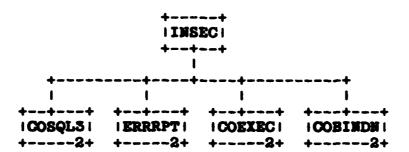


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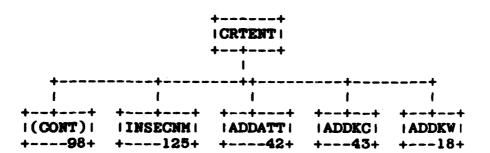
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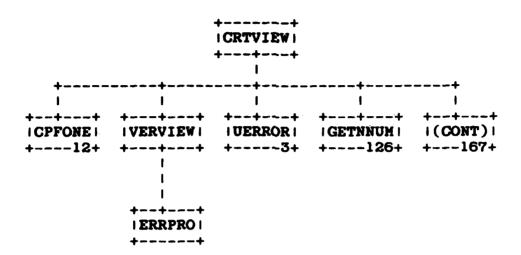
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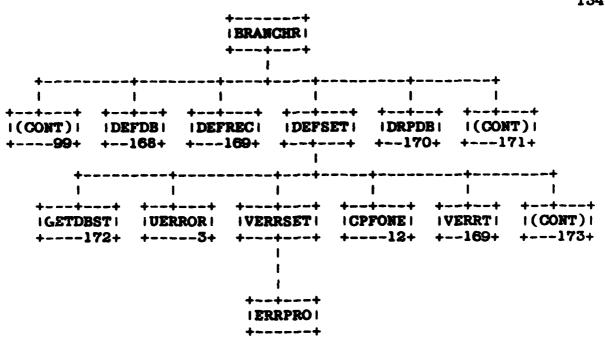
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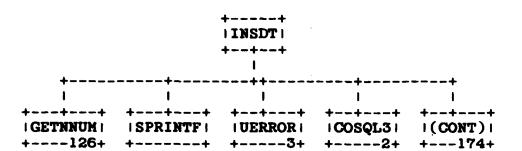


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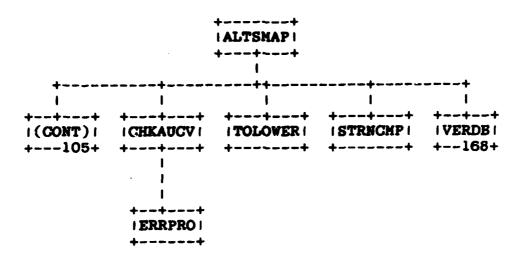


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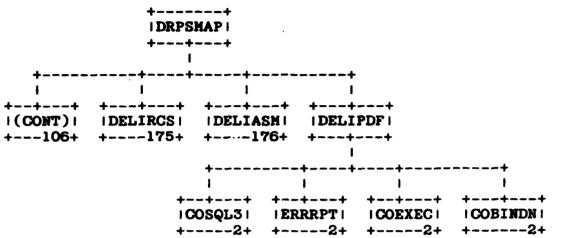




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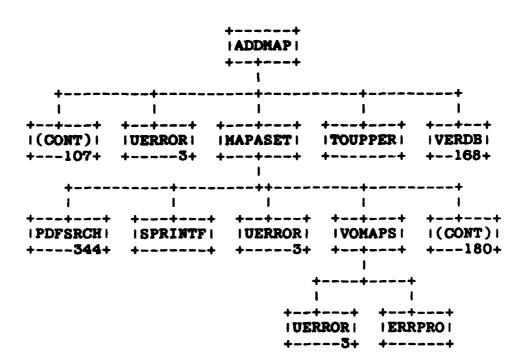


137

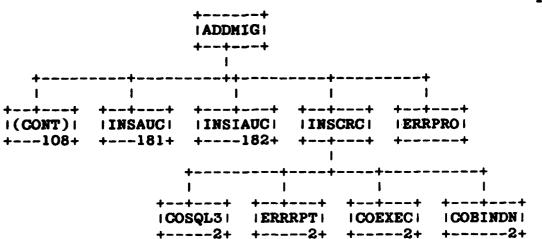


138 IMAPRCI +--+--+ | FNDASA | I VERRCMP I |SPRINTF| | UERROR | | INSRCRS | |FND1MEM| +----+ +----3+ +----178+ +----177+ +--+--+ +--+--+ | ERRPRO | ERRPRO +----+

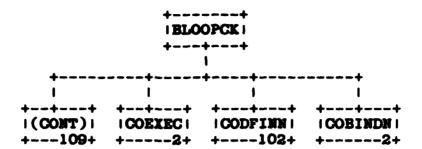
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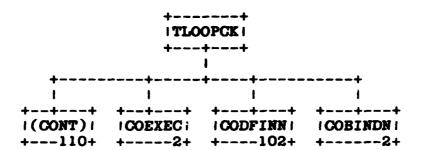
141



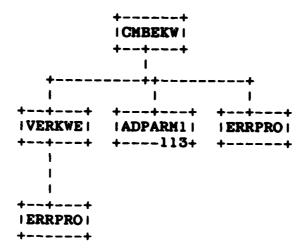
142



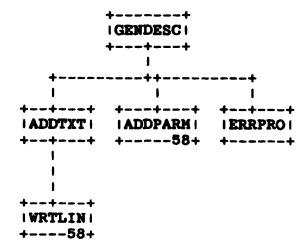
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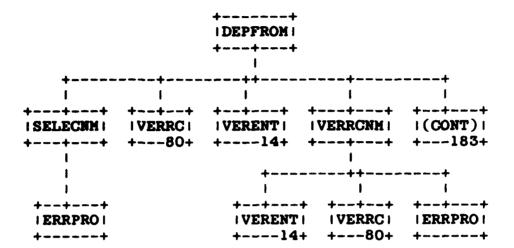
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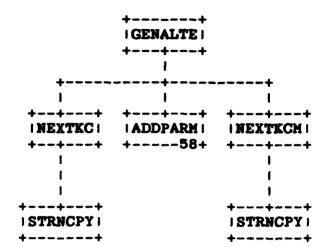
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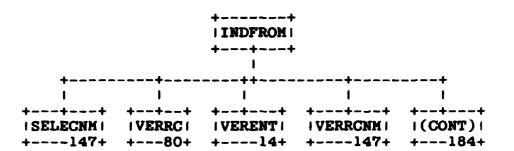


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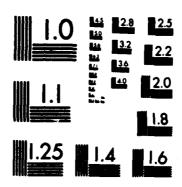


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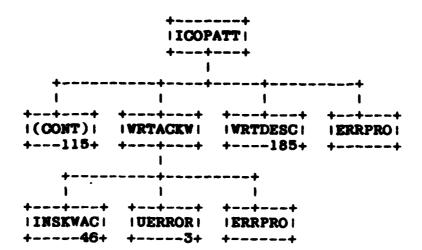


INTEGRATED INFORMATION SUPPORT SYSTEM (IISS) VOLUME 5 COMMON DATA MODEL S. (U) GENERAL ELECTRIC CO SCHENECTADY NY PRODUCTION RESOURCES CONSU. S SINGH ET AL. 01 NOV 05 PS-620141100 F/G 12/5 NO-8181 785 3/5 UNCLASSIFIED

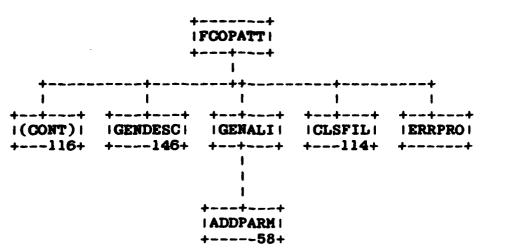


MICROCOPY RESOLUTION TEST CHART NATIONAL BUREAU OF STANDARDS-1963-A

150



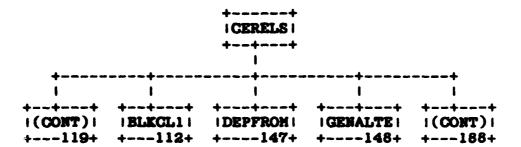
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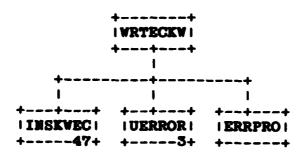
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154



155

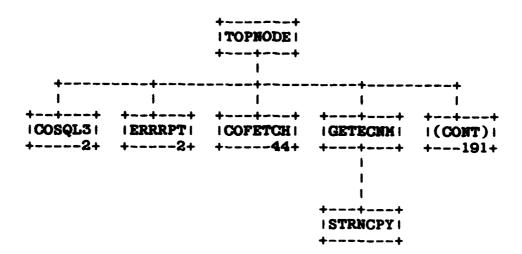


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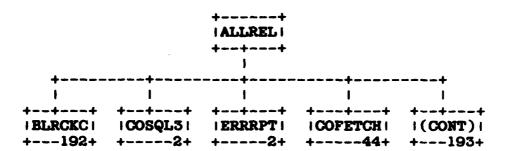
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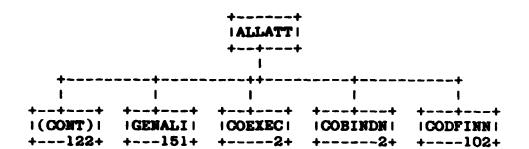
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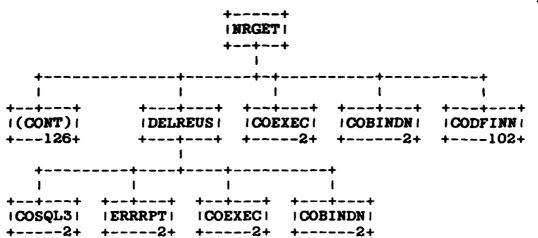




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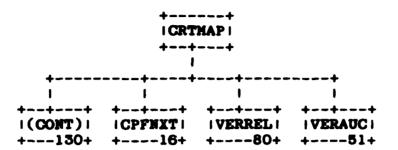




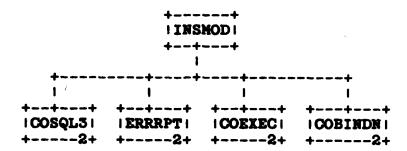
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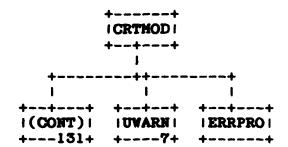


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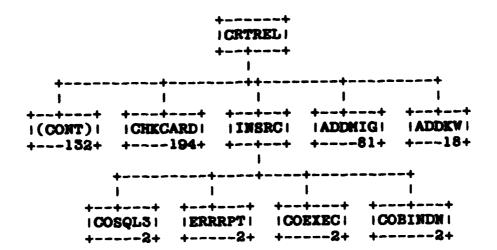


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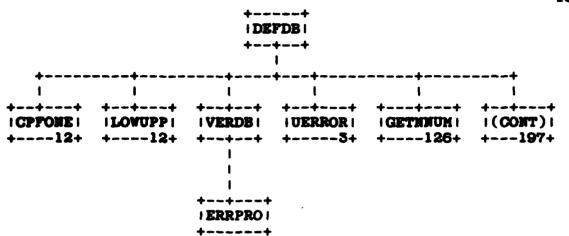


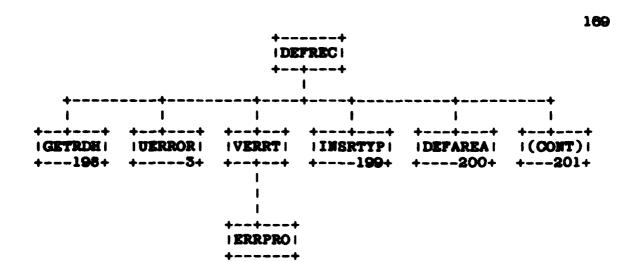
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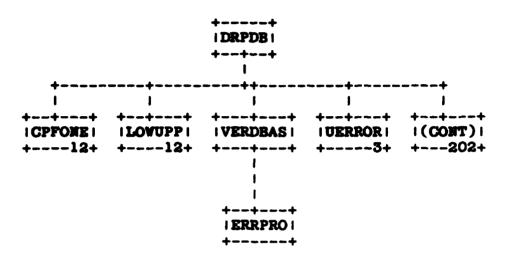
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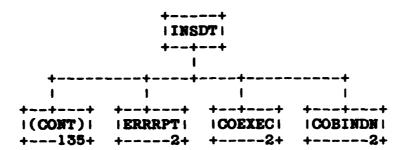




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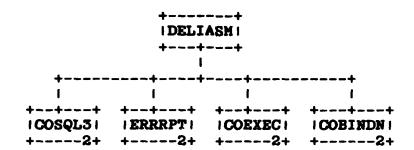
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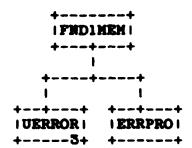
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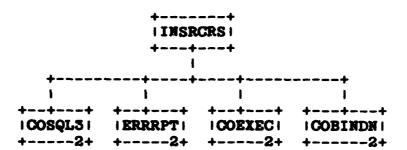
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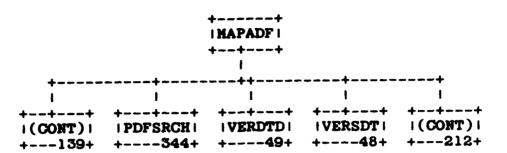
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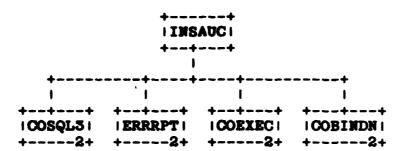
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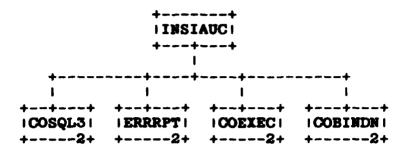
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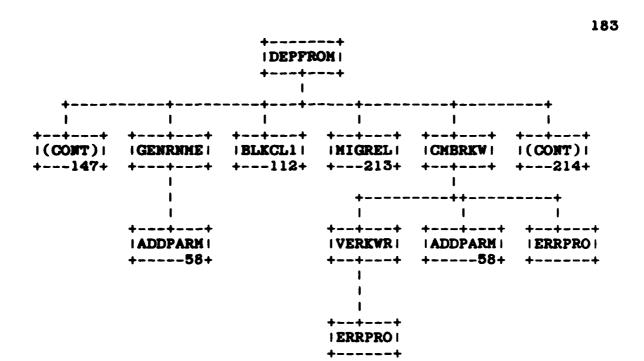


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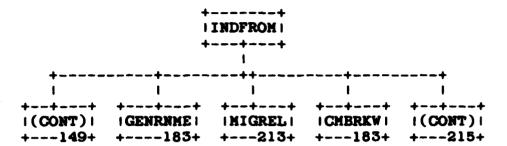


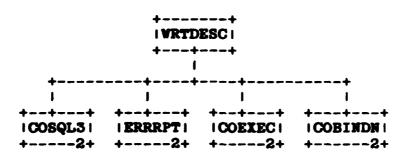
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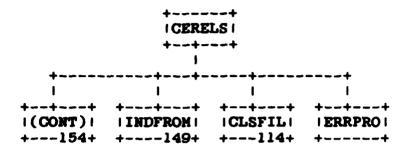




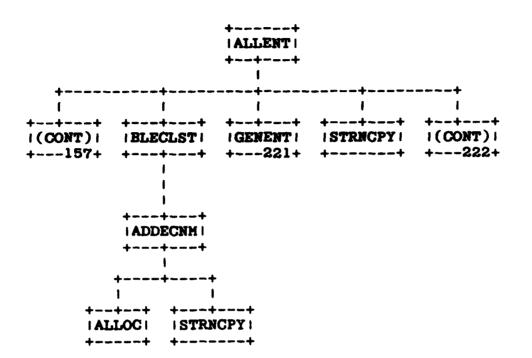
186

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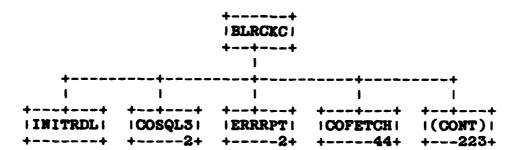
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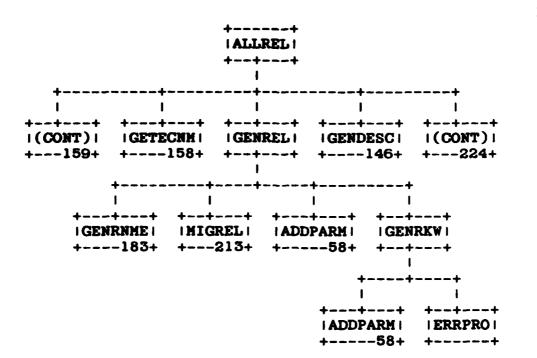
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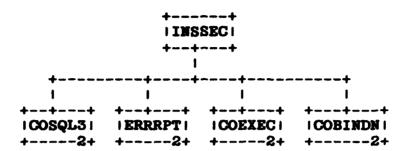
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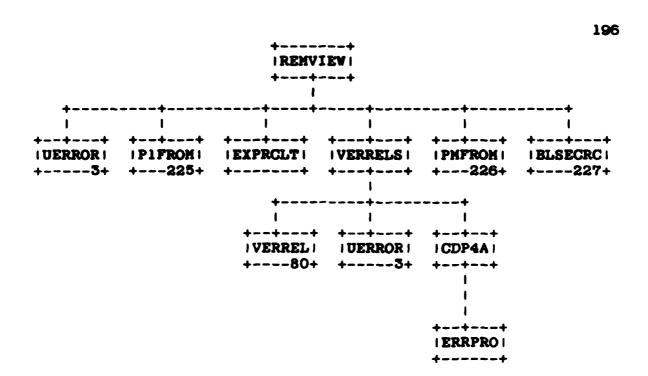


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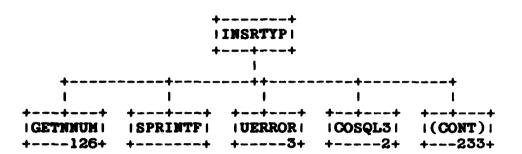


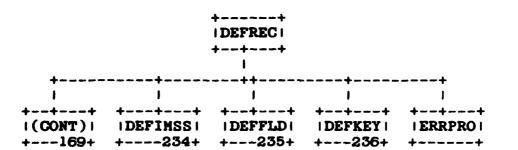
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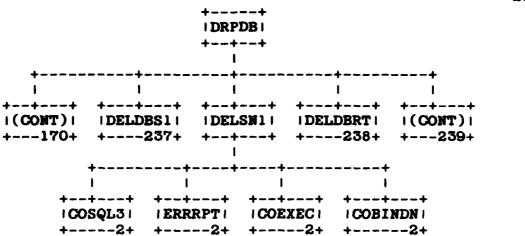


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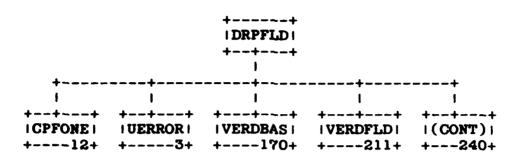




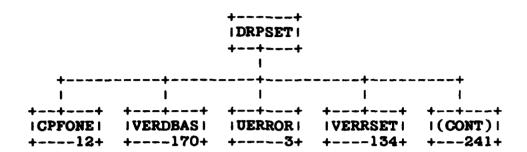
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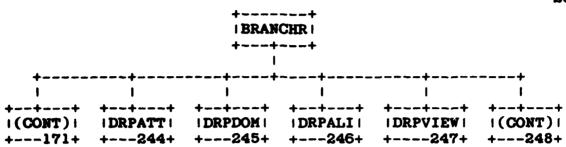


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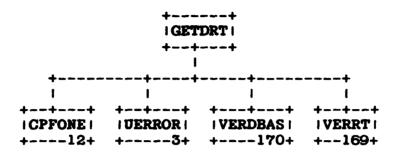


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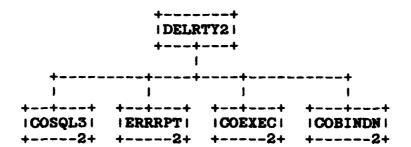
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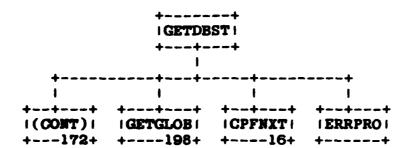
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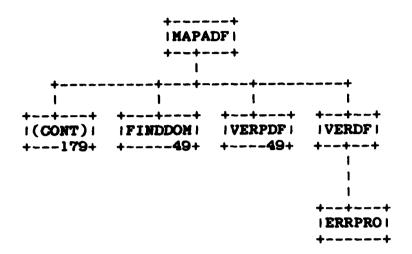


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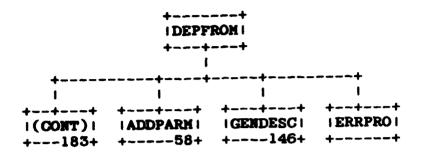




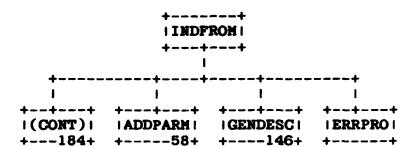
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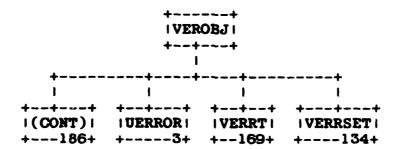
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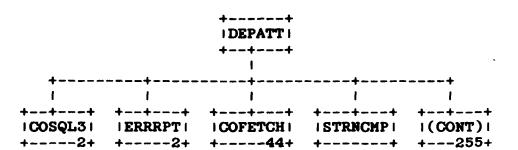
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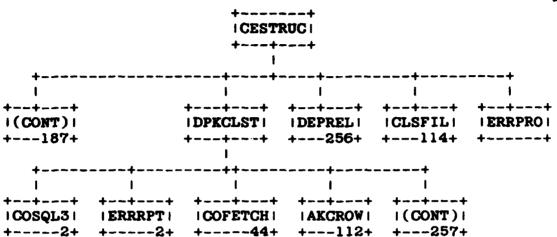
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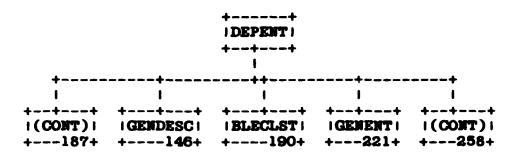
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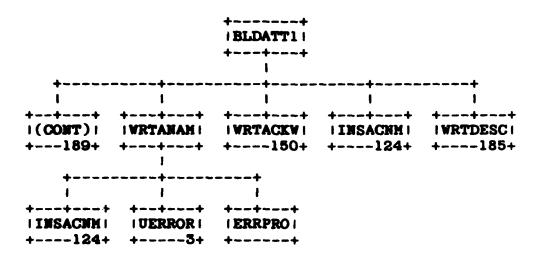
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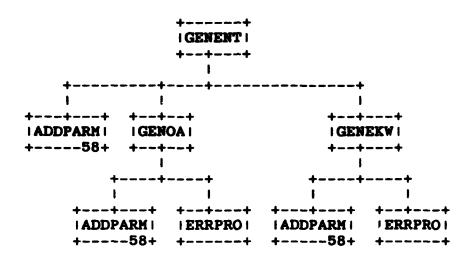


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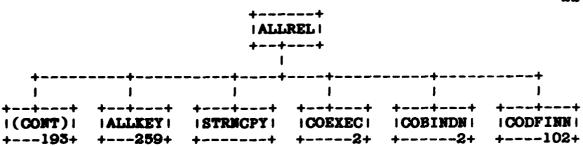
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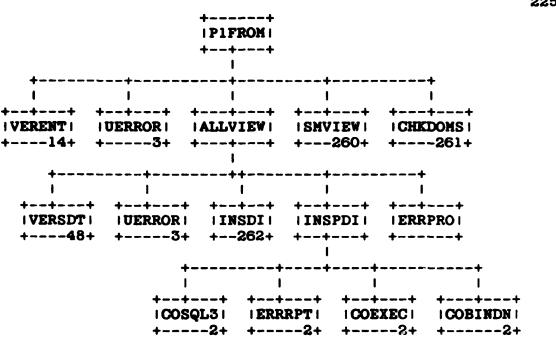


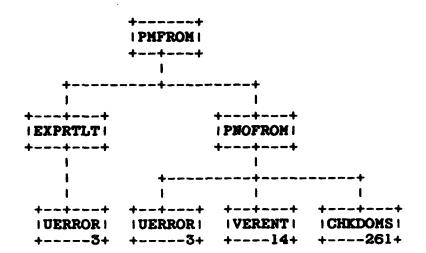


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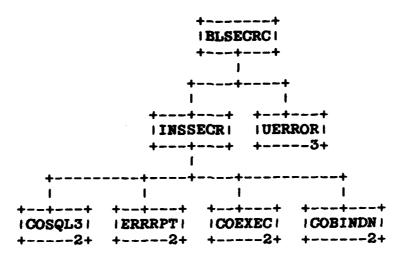
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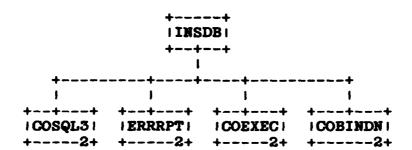




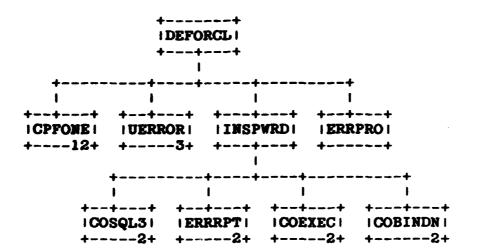
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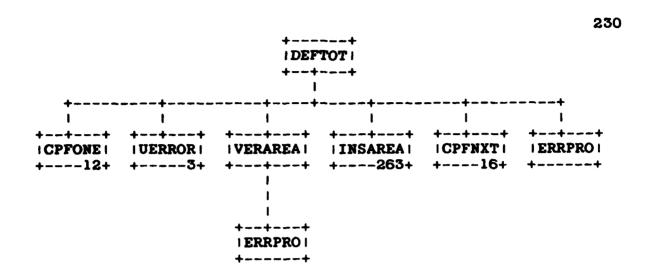
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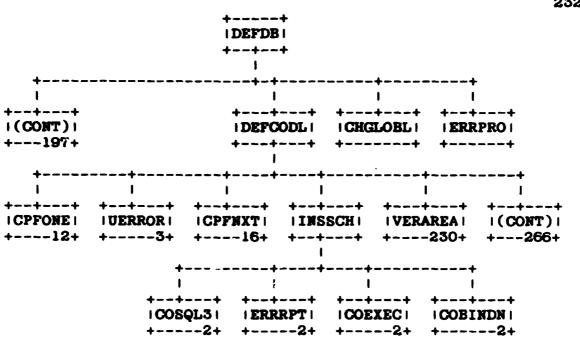
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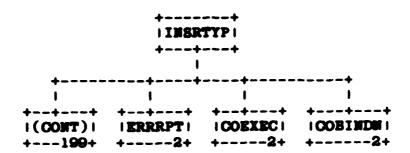


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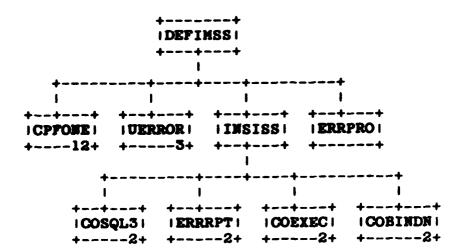


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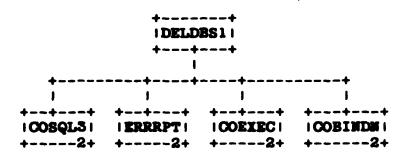
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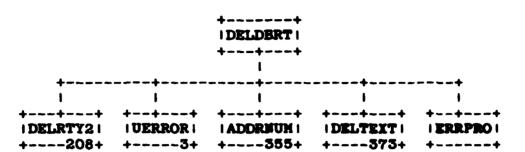
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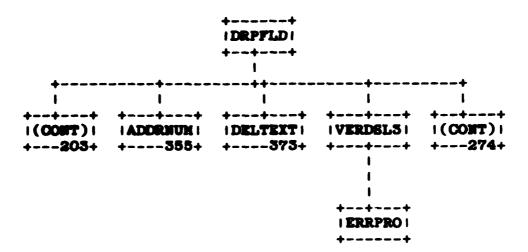
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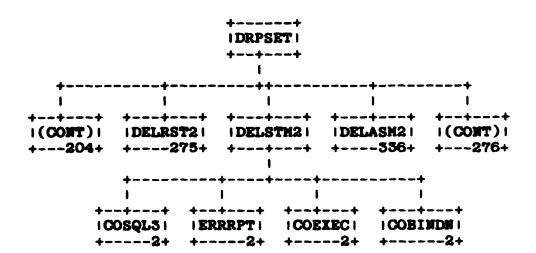


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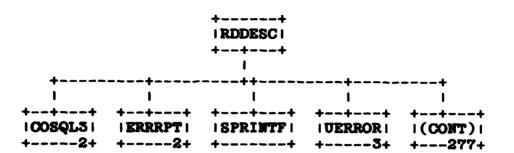
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240



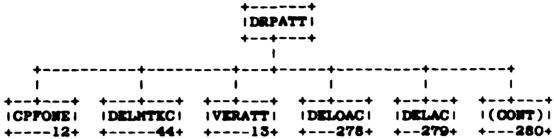


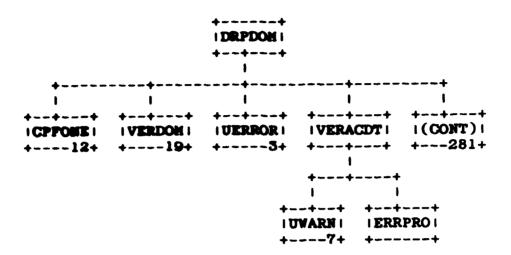
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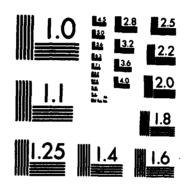
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244



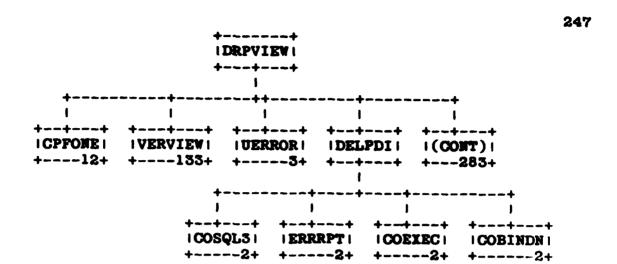


INTEGRATED INFORMATION SUPPORT SYSTEM (IISS) VOLUME 5 COMMON DATA MODEL 5...(U) GENERAL ELECTRIC CO SCHENECTADY NY PRODUCTION RESOURCES CONSU. SINGH ET AL. 81 NOV 85 PS-628141188 F/G 12/5 MD-8181 785 4/5 UNCLASSIFIED NL

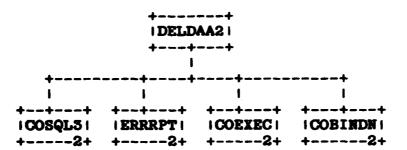


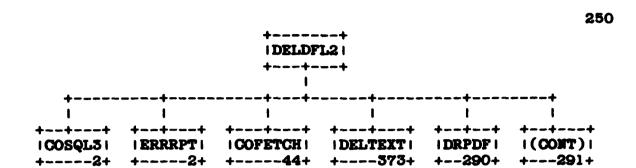
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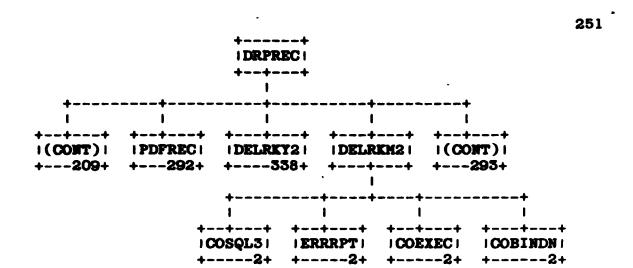




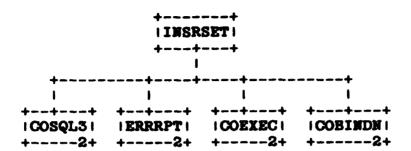
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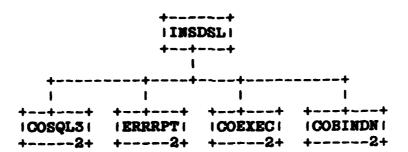


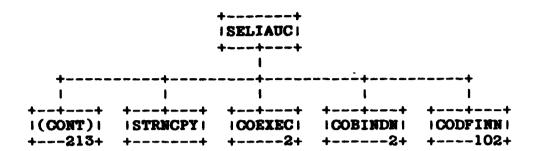


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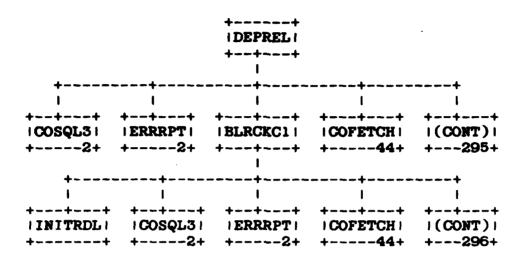


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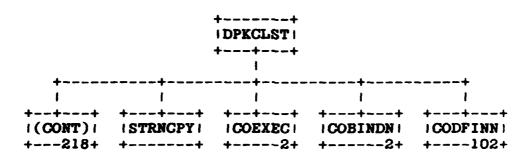


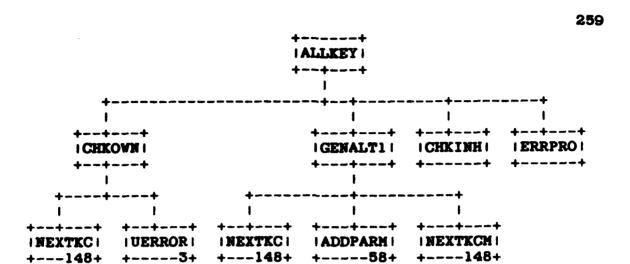


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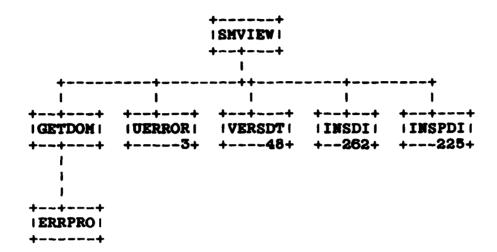


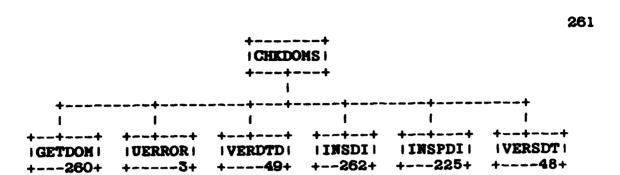
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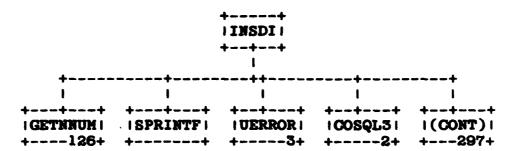


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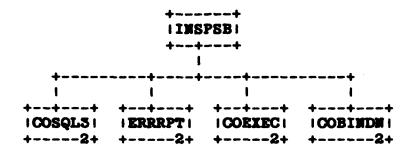
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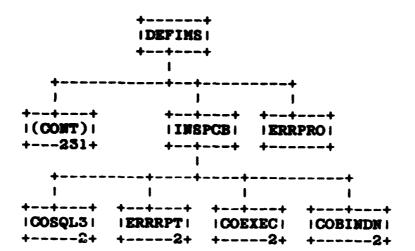
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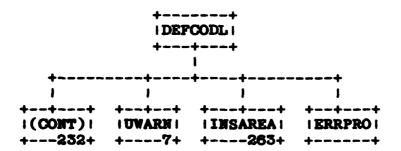
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265

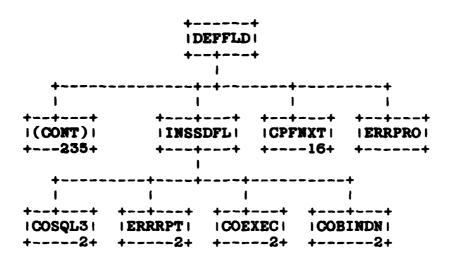


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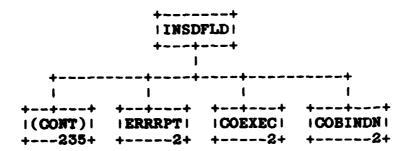


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267

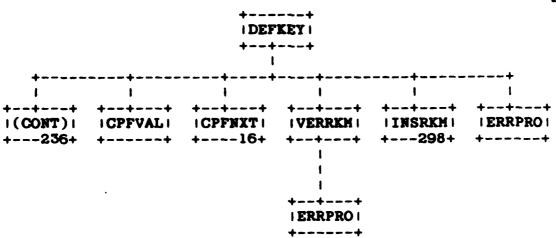


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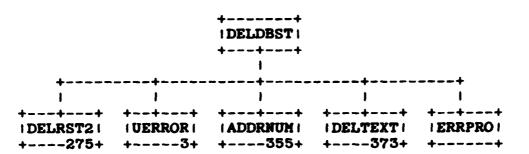


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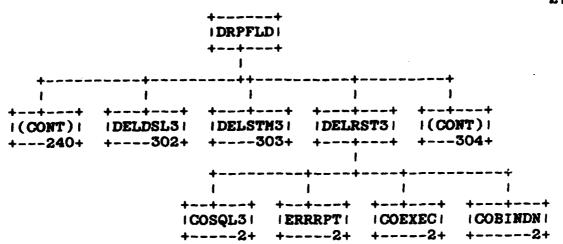




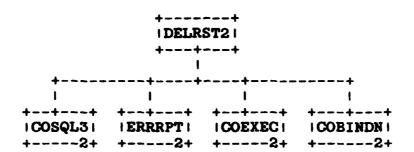
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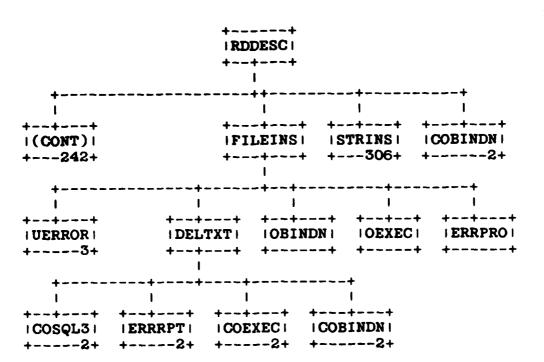
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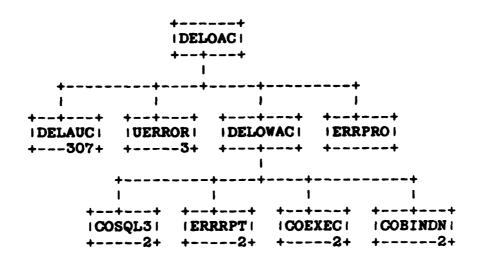
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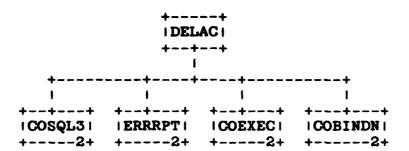
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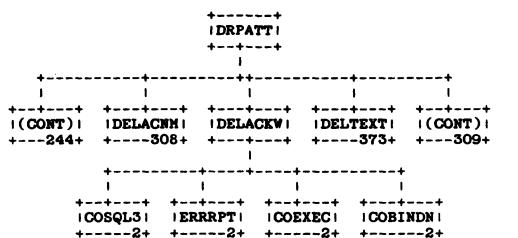


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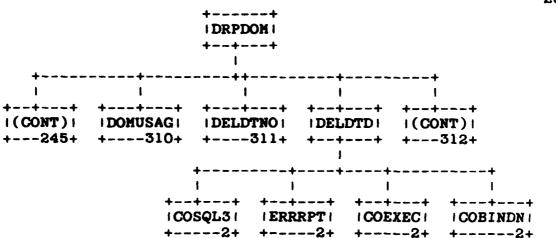


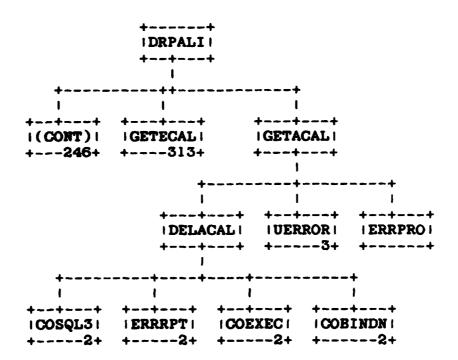
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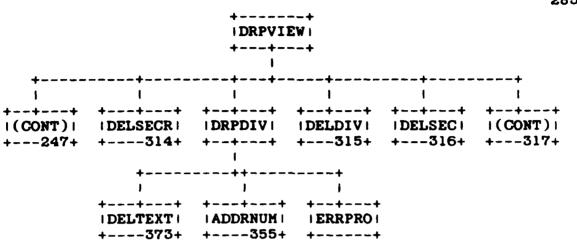


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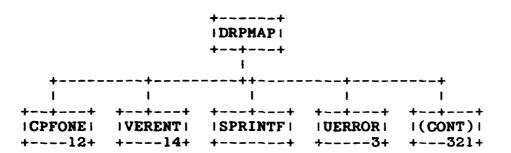




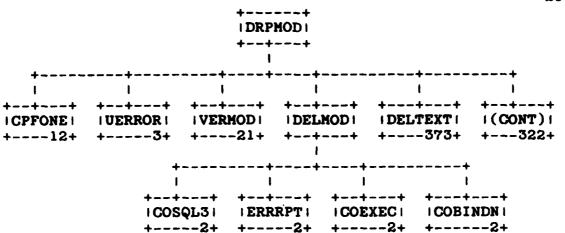
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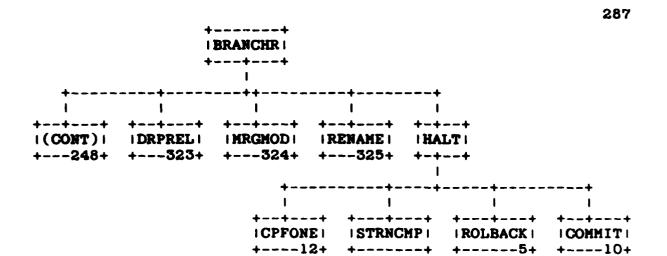


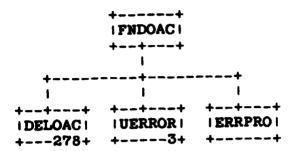
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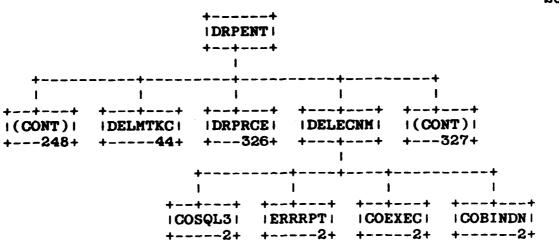
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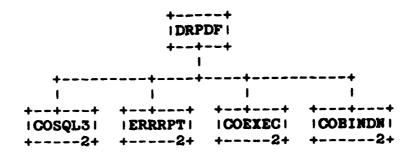




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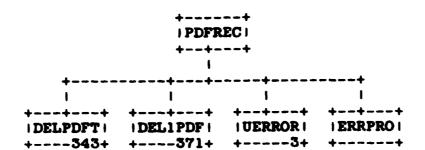


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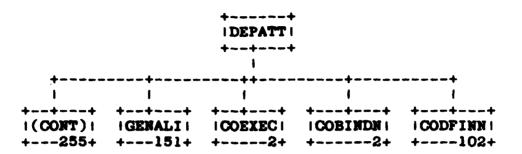


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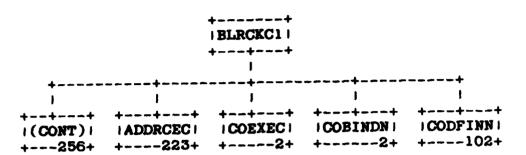


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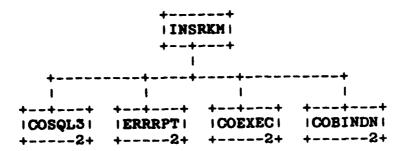
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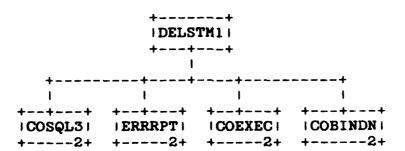
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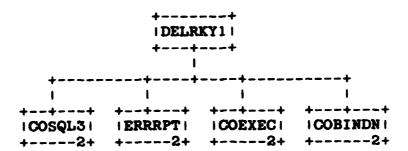


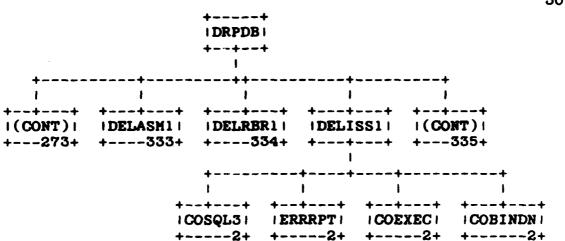
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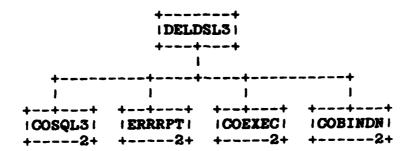




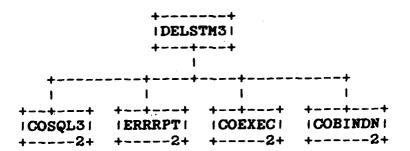




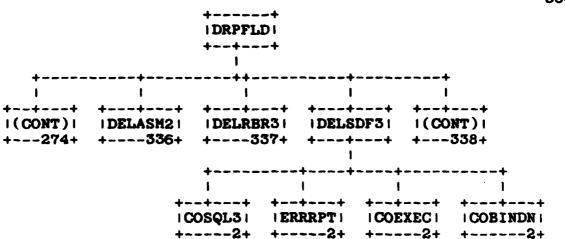
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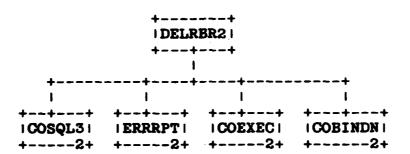


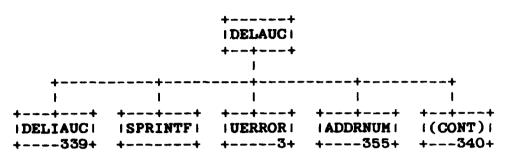
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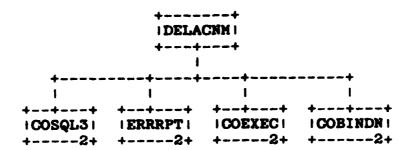
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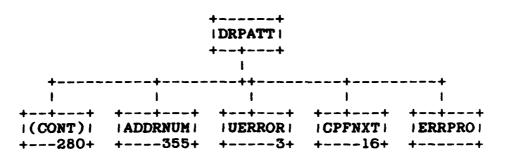




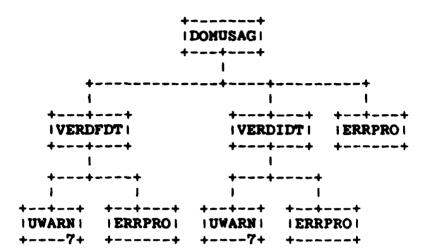


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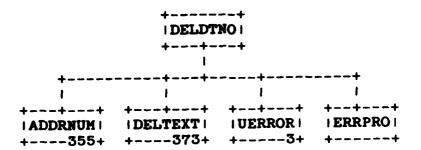


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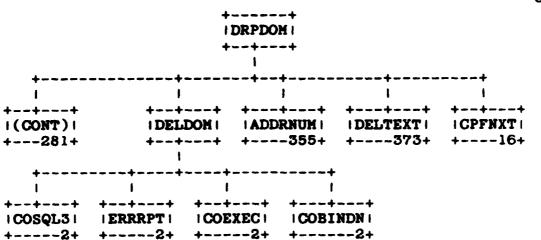


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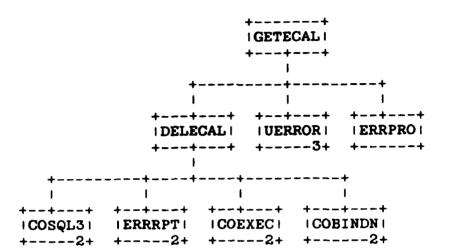
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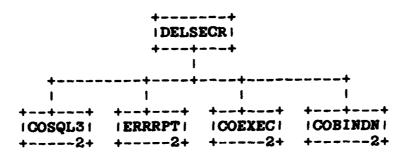
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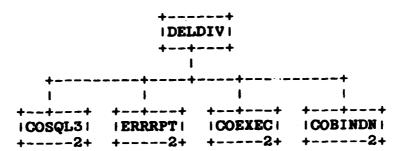
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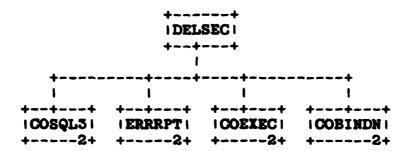
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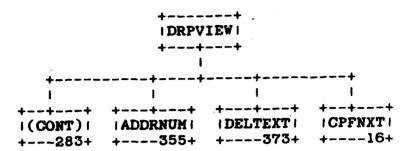
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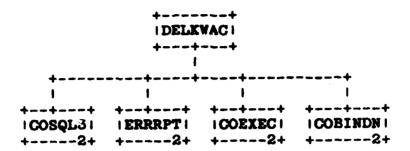
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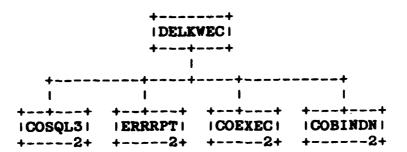


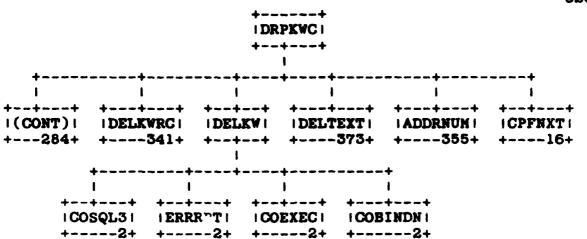
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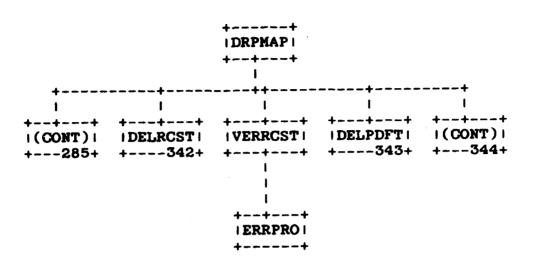
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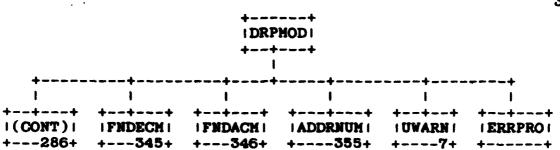




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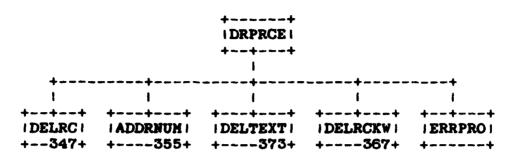
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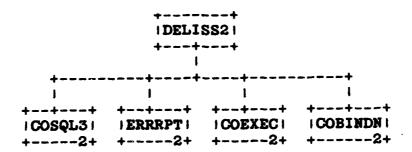
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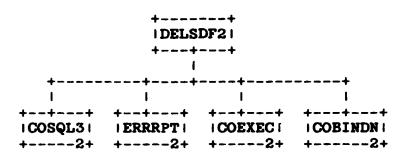
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324

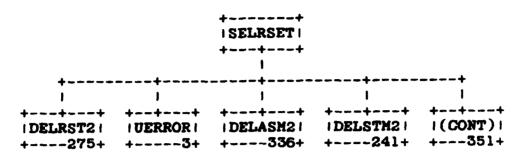


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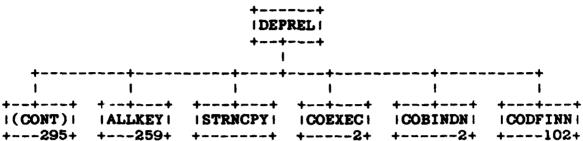


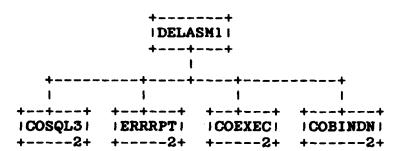
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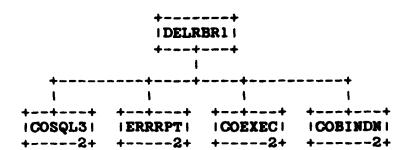
+---275+ +----3+ +---336+ +---241+ +---352+

332



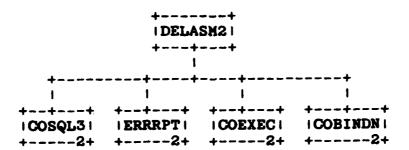


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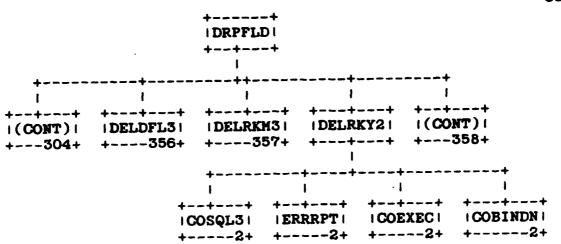
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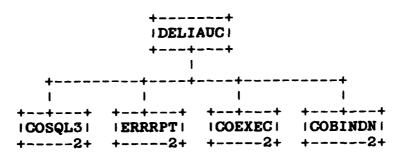
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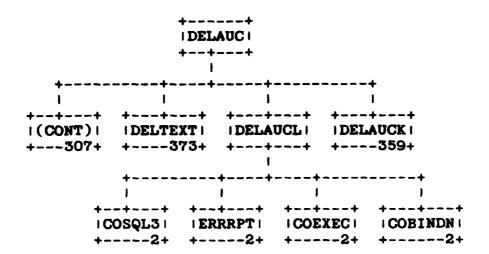


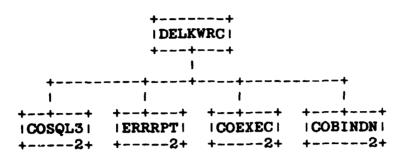
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338









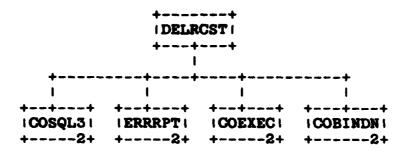
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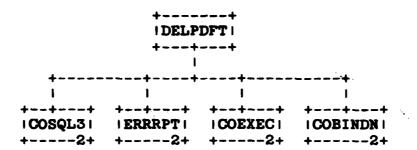


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342

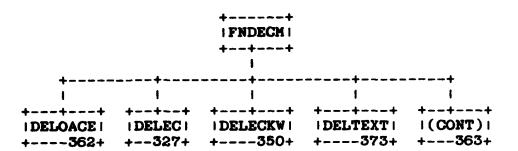


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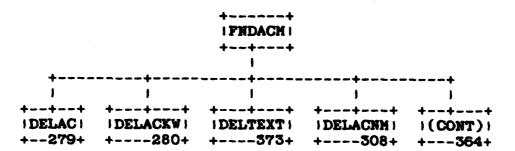


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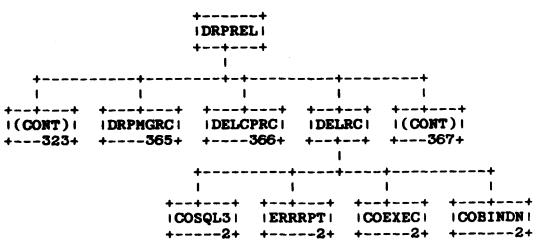
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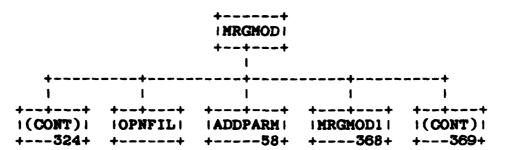
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347

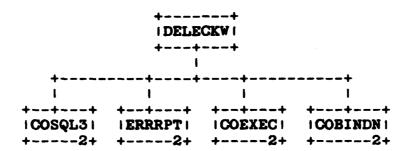


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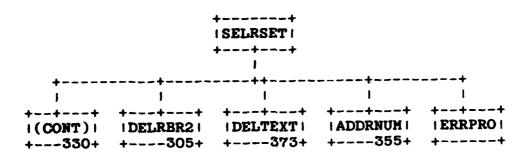


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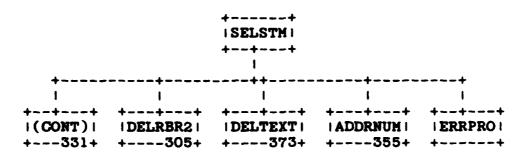
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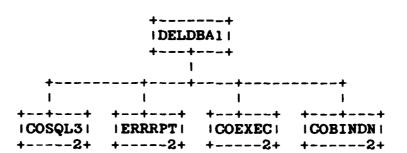


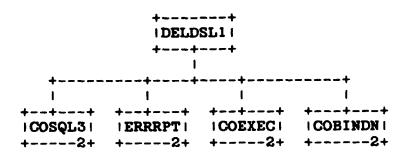
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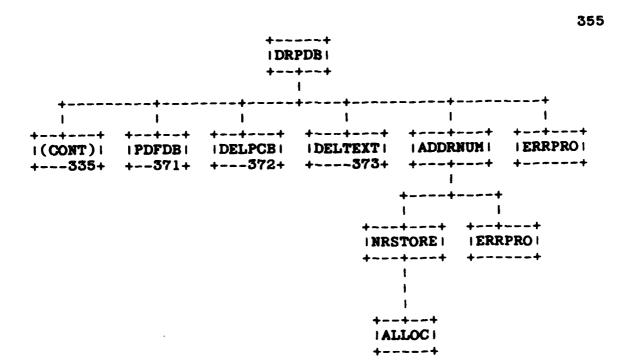
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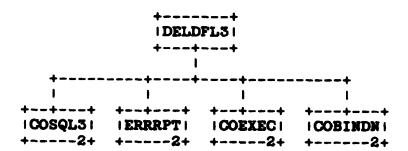




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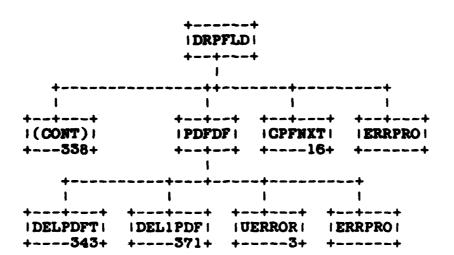
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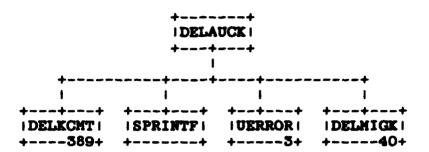
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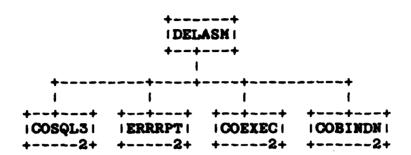


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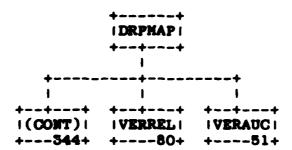


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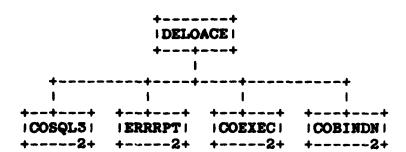




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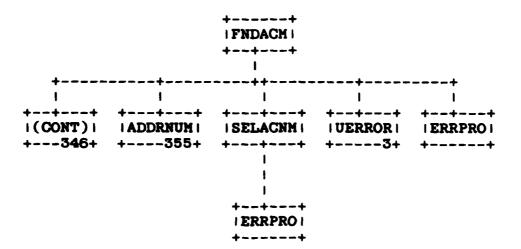


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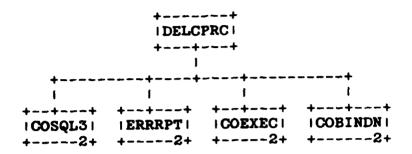


**36**3





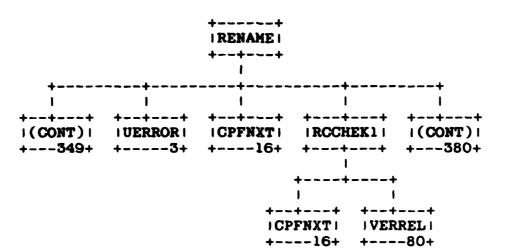
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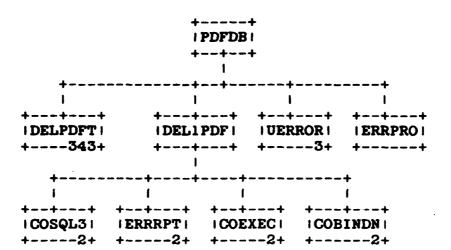


3-1483

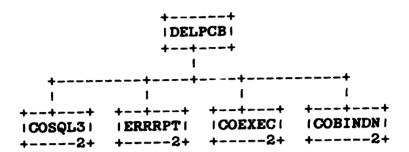
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370

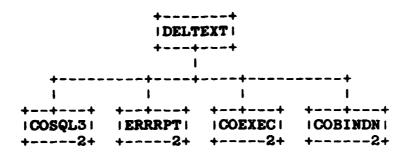




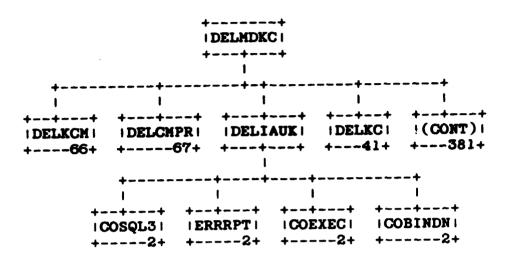
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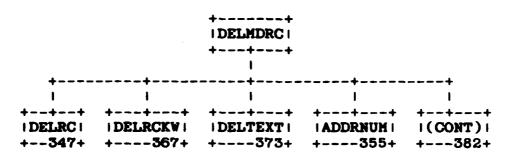


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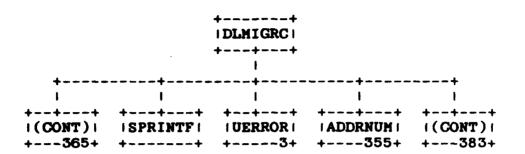


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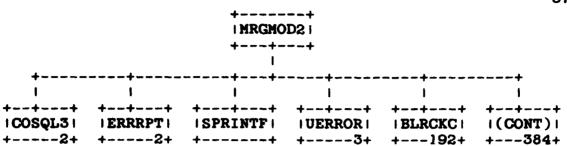


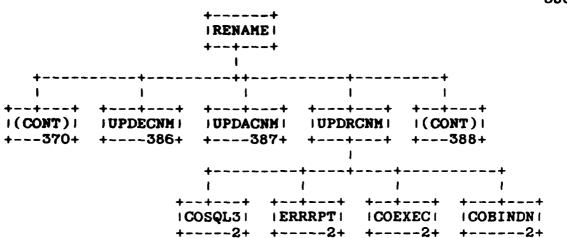


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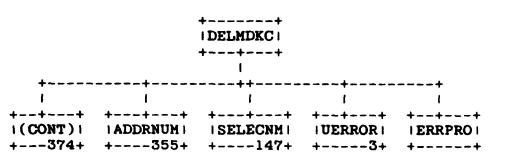


378

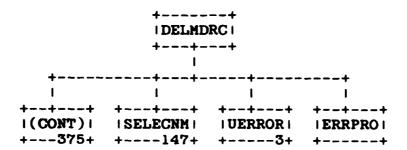


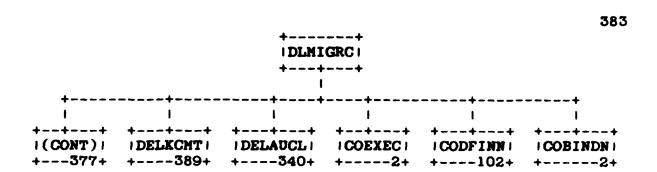


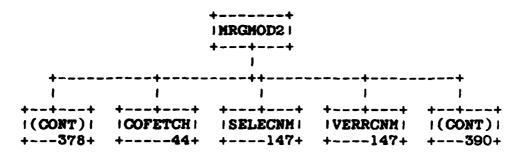
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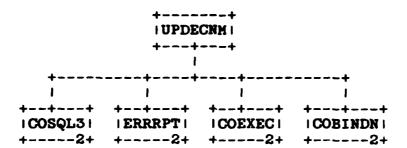
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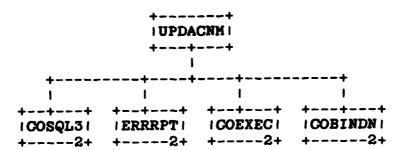




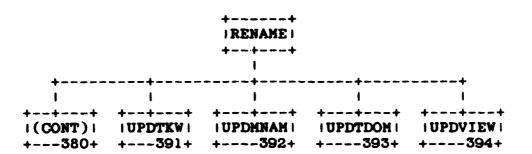
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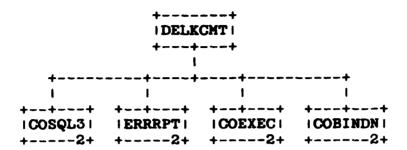
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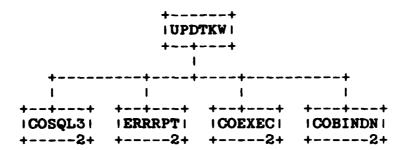


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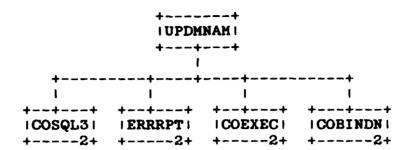


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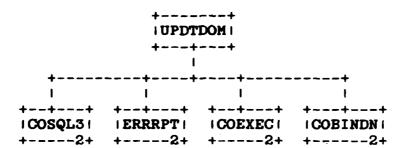


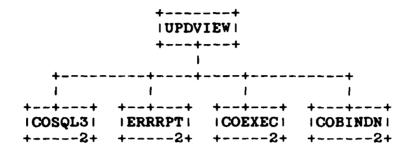
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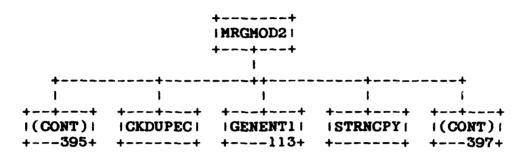


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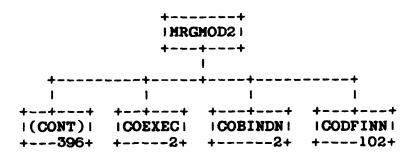
**3**93







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ADDEC	112	BLKCLST	121	COROL	
ADDECNM	190	BLOOPCK		COSQL3	2
ADDFRM		BLRCKC	192	CPFCOR	211
ADDKC		BLRCKC1		CPFNXT	16
ADDKCLS		BLSECRC		CPFONE	12
ADDKG		BLVWLST		<b>CPFVAL</b>	
ADDKM		BRANCHR		CPYDES	
ADDKW		CDP4A		CPYMOD	
ADDKWA		CERELS		CRTALI	
ADDKWE		CESTRUC		CRTATT	
ADDKWR		CHGDOM	17	CRTDOM	
ADDMAP		CHGLOBL		CRTENT	
ADDMIG		CHKATT		CRTMAP	
ADDNCORR		CHKAUCV		CRTMOD	
ADDNSTD		CHKCARD		CRTREL	
ADDOAC		CHKDOMS	261	CRTVIEW	
ADDPARM	-	CHKINH		DEFAREA	
ADDRCEC		CHKKEYS		DEFCODL	
ADDRNUM		CHKLOOP		DEFDB	_
ADDSTD		CHKMOD	_	DEFFLD	
ADDTXT		CHKOWN		DEFINS	
ADD_CORR		CHKREL	56	DEFIMSS	
ADD TO CNT		CKDUPEC		DEFKEY	
ADD TO LST ADPARMI		CKRNLST CLSFIL	114	DEFORCL	
AKCROW		CMBACAL		DEFREC	
ALLATT		CMBALI		DEFSET DEFTOT	
ALLENT		CMBEKW		DELIPOF	
ALLKEY		CMBENT	-	DELIPOF DELAC	
ALLOC	209	CMBOA		DELACAL	_
ALLREL	150	CMBRKW		DELACKW	
ALLVIEW		CMPMOD		DELACHM	
ALTALI		COBINDN		DELASM	
ALTATT		COCLOSE		DELASM1	
ALTCARD		COCOF		DELASM2	
ALTDOM		COCOM	_	DELAUC	
ALTDT		CODFINN		DELAUCK	
ALTENT		COERMSG		DELAUCL	
ALTMAP		COEXEC		DELCMPR	
ALTMOD		COFETCH		DELCPRC	
ALTREL		COLOGOF		DELDAA1	
ALTSMAP		COLON		DELDAA2	
ATTKW	88	COMMIT		DELDBA1	
BLDATT	123	COOPEN		DELDBDF	
BLDATT1	189	COPATT	<b>6</b> 0	DELDBRT	238

DELDBS1	.237	DELRCST342	DRPMIG82
DELDBST		DELREUS161	DRPMOD286
DELDFL1	2	DELRKM1273	DRPRCE 326
DELDFL2	. 250	DELRKM2251	DRPREC 171
DELDFL3	356	DELRKM3357	DRPREL323
DELDIV	. 315	DELRKY1300	DRPSET 204
DELDOM	312	DELRKY2338	DRPSMAP50
DELDSL1		DELRST2275	DRPVIEW247
DELDSL2		DELRST3274	DTUSAGE74
DELDSL3	302	DELRTY2208	ENTKW87
DELDT		DELSDF1335	ERRPRO
DELDTD		DELSDF2329	EFRRPT2
DELDTNO	311	DELSDF3304	EXCFLAG37
DELEC		DELSEC316	EXIT
DELECAL		DELSECR314	EXPRCLT
DELECKW		DELSN1202	EXPRTLT226
DELECNM		DELSTM1299	FCLOSE
DELIASM		DELSTM2241	FCOPATT116
DELIAUC		DELSTM3303	FCOPENT119
DELIAUK		DELTEXT373	FILEINS277
DELIPDF	137	DELTXT277	FINDDOM49
DELIRCS	175	DEPATT217	FMTIAUC213
DELISS1		DEPENT187	FND1MEM177
DELISS2		DEPFROM147	FNDACM346
DELKC	41	DEPREL 256	FNDASA138
DELKCM		DESCRB205	FNDASM105
DELKCMT		DLDSL2276	FNDAUC248
DELKW	320	DLMDAUC363	FNDECM345
DELKWAC		DLMIGRC365	FNDOAC 288
DELKWEC		DOMUSAG310	FNDRCM 50
DELKWRC		DPKCLST218	FREE
DELMDKC	374	DRPAC23	FRTOREL111
DELMDRC	375	DRPALI246	GDATA
DELMIGK		DRPATT244	GENAKW116
DELMOD		DRPDB170	GENALI151
DELMTKC		DRPDF 290	GENALT1259
DELOAC	278	DRPDIV283	GENALTE148
DELOACE		DRPDOM245	GENATT116
DELOWAC		DRPDT 74	GENDESC146
DELPCB	372	DRPENT 248	GENEKW221
DELPDFT	343	DRPFLD203	GENENT 221
DELPDI		DRPKC24	GENENT1113
DELRBR1		DRPKW30	GENOA221
DELRBR2		DRPKWC284	<b>GENREL</b> 193
DELRBR3	337	DRPMAP285	GENRKW193
DELRC	347	DRPMGKM40	GENRNME183
DELRCKW		DRPMGRC365	GETACAL282

GETCHAR	INSMOD164	OLOGOF
GETDBST172	INSOAC69	OLON
GETDOM 260	INSPCB265	OOPEN
GETDRT207	INSPDF139	OPNFIL
GETECAL313	INSPDI 225	OPNFRM
GETECNM158	INSPSB264	OROL
GETECS36	INSPWRD229	OSQL3
GETGLOB198	INSRC166	P1FROM225
GETMAPC78	INSRCRS178	PDATA
GETNCHR306	INSREUS10	PDFDB371
GETNNUM126	INSRKEY269	PDFDF358
GETNXNO126	INSRKM298	PDFREC292
GETRCID89	INSRSET252	PDFSRCH344
GETRCNM89	INSRTYP199	PMFROM226
GETRDH 198	INSSCH232	PMSGLS
HALT287	INSSDFL267	PNOFROM226
ICOPATT115	INSSEC195	PRCCMD1
ICOPENT93	INSSECR227	PRINTF
INDFROM149	INSSTM173	PROCDT33
INITCMD	KEYLOOK 156	PUTC
INITEX	LOADESC205	RACKW288
INITFP	LOGOFF	RCCHEK 349
INITRDL	LOGON	RCCHEK1370
INITSES3	LOWUPP12	RDDESC242
INSAC123	MAPADF139	RECKW287
INSACNM124	MAPASET140	RELKW89
INSAREA263	MAPRC138	REMVIEW196
INSAUC181	MIGREL213	RENAME325
INSAUCS180	MKRNLST81	RETACKW88
INSCRC141	MRGMOD324	RETECKW87
INSDAA200	MRGMOD1368	RETRAC159
INSDB228	MRGMOD2378	RETRACP88
INSDFLD235	MRGNODE 369	RETRCKW89
INSDI 262	NDDL/MAIN1	RETREC138
INSDOM127	NEXTKC148	RETRECP56
INSDSL253	NEXTKCM148	ROLBACK5
INSDT135	NRGET 126	RPLFRM
INSEC128	NRSTORE 355	RRCKW289
INSECNM125	OBINDN	SELACNM364
INSIAUC182	OCLOSE	SELECNM147
INSISS234	OCOF	SELIAUC213
INSKC71	OCOM	SELIKEY223
INSKCM101	ODFINN	SELRCNM111
INSKW31	OERMSG	SELRSET 330
INSKWAC46	OEXEC	SELSTM331
INSKWEC47	OFETCH	SMVIEW260
INSKWRC32	OISCR	SPRINTF

STRCAT		VERDSTP	61
STRINS	306	VERDSTX	
STRLEN		VERDT	103
STRNCMP		VERDTD	
STRNCPY		VERENT	14
TERMFP		VERKC	24
TERMSES	4	VERKW	284
TLOOPCK	110	VERKWE	
TOLOWER		VERKWR	
TOPNODE	158	VERMOD	21
TOUPPER		VERNMA	12
TRMNDML		VERNME	12
		VEROAC	
		VEROBJ	91
UPDAC	29	VERPDF	49
UPDACAL		VERPSB	231
UPDACNM		VERRC	
UPDECAL		VERRCBS	180
UPDECNM		VERRCC	323
UPDIND		VERRCMP	138
UPDMNAM	392	VERRCNM	147
UPDMOD		VERRCST	
UPDNXNO		VERREL	80
UPDRCNM		VERRELS	
UPDTDOM		VERRK	236
UPDTDT		VERRKM	270
UPDTKW		VERRSET	
UPDTRC		VERRT	
UPDVIEW		VERSDT	48
UWARN	7	VERSMS	180
VERACDT		VERTYP	103
VERACNM		VERUDTN	117
VERALI		VERVIEW	133
VERAREA		VOMAPS	140
VERASM		WRTACKW	150
VERATT		WRTALI	115
VERAUC		WRTANAM	
VERCRC		WRTDESC	185
VERDB	168	WRTDSC4	118
VERDBAS		WRTECKW	155
VERDF	212	WRTENAM	
VERDFDT		WRTLIN	58
VERDFLD		YYERROR	27
VERDI	91	YYLEX	
VERDIDT		YYPARSE	15
VERDOM	19		
VERDSL3	240		

# 3.11 Program Listings Comments

This information is contained in the Module Descriptions in section 3.10.

#### SECTION 4

#### QUALITY ASSURANCE PROVISIONS

## 4.1 Introduction and Definitions

"Testing" is a systematic process that may be preplanned and explicitly stated. Test techniques and procedures may be defined in advance, and a sequence of test steps may be specified. "Debugging" is the process of isolation and correction of the cause of an error.

"Antibugging" is defined as the philosophy of writing programs in such a way as to make bugs less likely to occur and when they do occur, to make them more noticeable to the programmer and the user. In other words, as much error checking as is practical and possible in each routine should be performed.

## 4.2 Computer Programming Test and Evaluation

The quality assurance provisions for test consists of the normal testing techniques that are accomplished during the construction process. They consist of design and code walk-throughs, unit testing, and integration testing. These tests are performed by the design team. Structured design, design walk-through and the incorporation of "antibugging" facilitate this testing by exposing and addressing problem areas before they become coded "bugs."